











PICK... Giving his system a new start.

## Pick breaks into IBM XT market

by Claire Gooding  
DICK Pick, author of the Pick operating system, has launched his own implementation of the operating system and relational database for IBM's Personal Computer XT.

Pick's announcement of the XT implementation confounds rumours that he was planning to abandon the project, because it was behind schedule, in favour of the Revelation look-alike from Cosmos.

"Drop it? I don't think so," says independent consultant Jonathan Sisk, who has been working closely with Pick Systems. "This is a breakthrough for Pick into a significantly wider market."

According to Sisk, it is possible to take any Pick software from existing systems and run it on the PC without change.

"That isn't possible with Revelation, which has many incompatibilities, and is not a complete implementation," he states. "This is complete and pure Pick: it can handle data dictionaries and programs."

The multi-user implementation uses an IBM-PC XT, with three terminals and a printer.

Pick Systems and Microdata, the first to implement the operating system, have signed an agreement with Cosmos, putting an end to speculation that Pick might sue the company.

Pick and Microdata will acknowledge Revelation as a Pick look-alike, and allow Cosmos to use the name 'Pick' in advertising material, in return for royalty payments from Cosmos. Neither company is endorsing or supplying

the product. "Pick simply has no interest in Revelation," says Sisk.

The main crowd-puller at the Reno conference was the CDI Series 1, the system which is being used to give the first public airing of Pick's long awaited new product, Release 84.

Pick told Spectrum conference that he has changed the name of Release 84 to Open Architecture Release 1.0, to reflect the considerable enhancements which effectively gives the Pick system a new start.

Pick has removed many of the limitations, such as large number handling, and changed the basic structure of the system so that it is more flexible.

Much to the relief of the flourishing Pick industry, the new release will still allow existing programs and applications to run without users noticing any difference.

"The structural enhancements mean that Pick's system can now be adapted to do almost anything people want it to do," says Sisk. One of the intentions declared by Dick Pick was to make Unix a subset of Pick, and link the two systems, with the aim of bringing a flood of applications on to the Unix market.

Over 2,000 people, many of them first-time users, have attended the Reno conference, and IBM is reported to be attending the conference in force.

"I doubt if IBM will sign a direct licensing agreement with Pick," comments Sisk, "but it is very interested in the system as a way of selling more iron."

## BT plans VDUs in phone boxes

by Donald Kennett  
BRITISH Telecom is planning to put touch sensitive VDUs into telephone boxes to give the public access to its new computerised directory enquiry service.

The computerised directory is to go into service in the second half of this year, initially at three centres in the North, the Midlands and London. It is primarily intended for use by directory enquirers operators and it is planned to cover the whole country by early 1986.

But when the £32 million contract was awarded to Standard Telephones & Cables last May, BT said that a gateway to Prestel would be provided on the system early in 1985. The service could then be accessed directly from home computers and videodata terminals.

BT now plans to run a trial to evaluate public reaction using touch-sensitive screens from its City Business System money dealer's terminal installed in call boxes.

If these arrangements are

successful, paper telephone directories could eventually be done away with, as the French PTT plans to do.

The French plans - first announced in 1977 - have suffered considerable delays, but BT's attitude is that it prefers to set up services that are commercially justifiable on a shorter timescale than that of the ambitious but risky French plan.

If BT charges at cost for its directory enquiry services, an electronic version could soon become cheaper than operator-based service. BT last year backed down in the face of objections from the Telecommunications Users Association from the idea of making any charge at all for a call to directory enquirers.

BT argued that the public made no objection to paying for a call to British Rail for a timetable enquiry, or for a platform ticket when they were not going to travel on the train.

The Post Office has no directories to look up the addresses for

use with its mail service - users rely on their correspondents telling them.

Alternative technologies for the call box device include speech synthesizers and touch-sensitive keypads.

Another possible technology, shown by IBM at Telecom 83 in Geneva in October, allows all the elements on the display to be integrated into a single chip, enabling display systems to be manufactured at very low cost. The 20 by 23mm device generates a visual image on its surface and this is then enlarged optically to make it intelligible.

Picture elements on the surface of the chip change from colourless to purple when a voltage is applied.

The central system for the directory enquiry service is to be based on software from Computer Consoles in the US, running on Digital Equipment PDP-11/44 and CCI Power 5 minis. It will be updated daily from BT's ICL 2900-based directories database.

## Swedes pick Sperry's \$4m giant

THE Swedish telecommunications administration has ordered Sperry's biggest and most powerful computer, the 1100/92 multiprocessor, which is valued at \$4 million. It will be installed at Stockholm later this year, where it will support 3,000 terminals for computer-assisted work on management and provide backup facilities for 2,000 more.

The system will replace a pair of 1100/83s, which will be transferred to work.

### BHS contract

BRITISH Home Stores has placed a £400,000 contract with Chaparral Cash Processing of Telford for 30 microcomputer-based cash management systems to be installed over the UK. The systems are designed to bridge the gap between point of sale and management information by providing statistics on item movement, cash flow, operator efficiency, income per square foot, seasonal fluctuations and sales trends.

### HP wins order

HEWLETT-PACKARD has won a £2.1 million order from Mail Box for software and hardware to streamline its production planning operation. The hardware will consist of 57 HP150 touch-screen personal computers linked to 11 HP3000 minicomputers, eight manufacturing sites and three centralised administration and development work.

### That's the ticket

THE Bank Settlement Plan, devised by 30 airlines to simplify ticket issuing procedures for travel agents, will be implemented at Datasouth DS180 matrix printers. These will be installed at the 20 travel agents that make bookings through British Airways' travel reservations subsidiary.

### Course support

DEI/TA Computer Aided Engineering of Birmingham has won a £100,000 contract to support Warwick College of Technology in its work for the Manpower Services Commission on the Open Tech project, which will set up technician and supervisory level courses for learners to take at their own pace.

### BT spends

BRITISH Telecom's National Networks division has ordered £400,000 worth of Altek microcomputers and terminals from Windows-based NBS Microstar for use in planning track services. The hardware is 26 Xerox-based 16-bit Altos 986 micro, two 186/2 minis and 124 Altos II smart terminals.

### Checks on yachts

BEDFORD Computers' latest use of its Yacht Prediction Program is to the Greek Yachting Association. The program runs on an Apple II in the year since its launch it has been sold in 20 countries to help check yacht designs for performance and for compliance with international off-shore racing rules. The British Admiral's Cup team is one user, and the company reckons its program has been used in designing £10 million worth of racing yachts.

### Police deal

IAL Gemini has beaten Honeywell and Leasos to a £1.2 million contract from South Yorkshire Police for a turnkey command and control system. The system is to be installed by the end of next year, when it will support terminals in nearly every police station in the county. It will be based on Data General hardware running IAL Gemini software and it will support street indexing, incident handling and message switching.

## Zenith jumps into compatible market

by John Kavanagh  
US television and radio giant Zenith has jumped into the IBM-compatible personal computer market with desk-top and portable models.

Zenith Data Systems is just getting going in the UK and Europe, but it claims to be the world's number four supplier of microcomputers costing between \$3,000 and \$6,000 - after IBM, Tandy and Commodore. Its parent, the \$1,300 million Zenith Radio, is a household name in the US, because it is one of the top two television manufacturers.

Zenith says it can undercut IBM and other competitors by up to 21% because it makes its own screens, power supplies and other components - and sells them to those competitors.

The company is close to winning orders for the new products totalling over \$50 million from four big US OEMs. And if its US distributors' initial order rate continues its total business from these two sources will be over \$110 million this year, compared with \$70 million from US sales of its

existing Z-100 eight- and 16-bit computers last year.

The new Z-150 and Z-160 machines have the same Intel 8088 processor as IBM's product. They run Microsoft's MS-DOS operating system, on which IBM's PC-DOS is based. Compatibility is ensured through firmware.

On the hardware front the machines have four expansion card slots, compared with two on the IBM Personal Computer. In addition two standard serial and one parallel port are built in; IBM extra boards are needed.

On the software side Zenith is supporting Microsoft languages and word processing software and the Lotus 1-2-3 modelling package, with its own manuals. US prices start at \$2,699 for a single floppy disc version with 128K of memory. A model with two floppy discs and a 10.6-Mbyte Winchester disc costs \$4,799.

UK managing director Terry Hart says UK prices will start at around £2,100. The machines will be launched in the summer. The company has 15 UK staff and 70 dealers.

## Small aid streamlined

by George Black

THE government will announce plans in May to streamline its aid to small businesses. Junior Industry Minister David Trippier told the parliamentary information technology committee that he was "repackaging" the present 88 official assistance schemes into four or five and would complete the work by May.

"We are confusing the very people we are trying to help," he says. The new categories will require the current Support For Innovation grouping and consolidate

various advisory projects into one.

He says there is no evidence of demand for the £75,000 ceiling on the amounts eligible for the loan guarantee to be lifted. The average application is £33,000, he says.

The loan scheme, which runs out in May unless renewed, has a current failure rate of 8%. But it is defended by Barclays Bank corporate manager, Peter Hornby, who claims that the failure rate is falling and will come down still further. "It is better balanced now and, given a chance, should succeed," he told the committee.



GWYN JONES... "It's a major endorsement of our product."

## Councils drop ICL package

by George Black  
TWO more local authorities have abandoned ICL's software package for handling claims to housing benefits. They say that it causes delays in payments as well as wrong payments. At the last count ICL admitted 102 bugs.

Salisbury and Guildford have both defected to a package from the small Swansea software house, BMSL, in a deal which represents an extra income of over £30,000 to BMSL and a kick in the teeth to Europe's biggest computer manufacturer.

BMSL chairman Gwyn Jones is very pleased that the two have opted to switch. "It's a major endorsement of our product and we are expecting more of them to follow now," he says.

The deputy treasurer of Salisbury council, Brian Coveney, says that ICL's package has not lived up to expectations and it could not

put up with the faults any longer. "It creates a lot of extra work for staff when we are under pressure from the government to cut back," he says. "Admittedly the timescale for implementing the new legislation was too short, but ICL did not treat the project seriously enough."

Some users are said to have taken on the ICL package, but many of them have since switched to others and several are still considering doing so.

The Guildford treasurer, Walter Jones, says the features of ICL's programs relating to students have been given low development priority.

"Six basic changes a year are needed to handle the question of students and we have had to deal manually with these," he said. "We couldn't wait for ICL so we've switched to a package which can do the job."

## Harris aims to manufacture in UK later this year

by Nuala Moran

HARRIS, the US electronics giant, will start manufacturing in the UK later this year. Products will be for the office automation market, which it will be attacking with its merger partner, business systems supplier Lanier.

Lanier's UK managing director, David Reavley, is not able to com-

ment on where the factory will be because, he says, "negotiations are at a very delicate stage. We are looking for somewhere at the right price and with a high technology workforce". He expects the factory to be operating by the second half of this year.

Both Harris and Lanier machines will be made at the factory, but, Reavley says: "It's difficult to specify at this stage exactly what we will build there, we're looking at several product lines."

Meanwhile Harris is busy integrating Lanier marketing operations with its own in Europe, Africa and the Middle East, bringing them under the umbrella of Harris Systems international divi-

sion in Geneva.

Lanier offices here in the UK and in Germany will be merged with Harris subsidiaries.

Plans have also been announced for interfacing the two product lines. Harrisnet, the LAN for the Harris 9000 office system, will become the standard for all Harris and Lanier products.

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## SPL gets Thames barrier job

by Nuala Moran

A MANAGEMENT information system which will reduce the costs of operating the Thames flood barrier is to be supplied by SPL, International.

The barrier is designed to limit the Thames during a tidal surge, but allow access to river traffic at all other times.

The system is based on a DEC Vax 11/750. It will help avoid the

necessary closure of the barrier and in minimising the length of each closure.

This will reduce operating costs and reduce disruption of the river's traffic.

Barrier control strategy will be determined by a mathematical model which will be based on river tidal, meteorological and five-day conditions. The system will be linked to an IBM main-

frame in the GLC's headquarters at County Hall, and will also be used to produce forecasts of possible non-tidal flooding in the London area.

The contract to supply the system, worth £400,000, was awarded by the GLC. Spanning one third of a mile across the Thames at Woolwich Reach, the flood barrier is due to be opened officially on May 5.





CHRISTENSEN... "Places where Ethernet has an application."

## US company fetches its local network to the UK

by Donald Kennett  
US DATA communications firm Network Systems (NSC) is bringing its 10 Mbit-per-second local area network Hyperbus to Britain - at prices down to \$250 a port.

The two-year-old product joins the product that has fuelled the company's growth to \$10 million profit on last year's \$47 million sales, the Hyperchannel 50 Mbit-per-second network.

And the company is whipping up enthusiasm for its next product up the range, a 275 Mbit-per-second network called Data Pipe which it plans to launch around the end of the year.

Hyperbus has been on sale in the US since 1982, but only 35 systems have been sold, mostly into sites that were already using Hyperchannel for their high-speed mainframe links.

Three Christensen, one of the three ex-CONTROL Data engineers who founded Network in 1974,

explains: "Hyperchannel is a \$40,000 box and you can have two of them to a mainframe port, so that's an \$80,000 port cost. Hyperbus uses \$4,000 boxes and you can hook 16 personal computers or whatever on to them. So at the other end that's a \$250 port cost."

"We haven't priced the Data Pipe yet, but it will be expensive because it's higher up the hierarchy. We haven't had any competition with Hyperchannel and I think it will be the same with Data Pipe, but we don't know how big the market is."

"Many of our customers have campus type environments and very high speed applications. For IBM to do it probably wouldn't be worthwhile, but for us it is."

Hyperbus is a proprietary system that runs at the same speed as Ethernet, but until open systems standards cover a more complete range of networking activities, its makers will have some

justification in claiming greater universality.

But Christensen is confident: "I think Ethernet will be a standard for a certain group of users - there are places where Ethernet has an application. But IBM, AT&T and Wang aren't using it and who the hell else is there? Users are in no doubt that there will be multiple standards."

Data Pipe is an optical fibre based high-speed "backbone" network that can run for 20 kilometres and can make full use of public wideband digital transmission facilities such as satellite links and British Telecom's Megastream circuits.

"I never ask them what they are going to use all that data for," says Christensen. "A local area network is a multiplexer of applications into high-speed circuits. Our friends at Cray say 'what are you going to do when we have a 200 megabit channel?' and we say 'when you're

ready we'll be ready'."

"The other thing we're worried with is optical disc storage. Its capacities are so tremendous that you can't talk about 10Mbytes just your arithmetic tells you going to take 27 years just to fill it up. It needs gallium arsenide technology, VLSI to make it economical, a protocol structure and addressing theory."

Network Systems has filed patent suit against Massor's comment that it will make its own work boxes to run the software previously sold with Network Systems' adaptors. "There's enough evidence in our minds that they're infringing on our patent," comments Christensen. "If since they've never shipped a product there's insufficient ground for a suit, and an anti-trust act that says we're trying to dominate the market."

## Olivetti plugs three gaps

by Keith Holder  
OLIVETTI has taken three new IBM plug compatible computers on board in a renewed attempt to beef up its efforts as a big computer systems vendor.

Two of these are Hitachi machines already available in the UK through National Advanced Systems (NAS) and BASF, which introduced them last month to compete with IBM's 4381 mainframes.

The third machine is a new diadic (dual) processor from US independent IPL, the 5350, which is ready to be shipped now. This is a three mips machine, which will form the top end of Olivetti's IPL range.

Users of existing IPL machines will not be able to upgrade,

however, as the new machine has a redesigned chassis, incompatible with the old components layout.

Olivetti badly needs to get into the market and sell some machines if this latest attempt to push in on the PCM market is to succeed.

Jeff Evans, manager of the revised plug compatible computer division, says that he expects to be announcing some sales soon, a result of a concerted effort by his salesforce, which can now deal solely with the computer market.

He expects to gain "a significant share of the PCM business" in the UK over the next two years and would like to see this reach 10% in some sectors, like terminal sales.

He refutes recent reports that the company will rely on machines from US maker CPS.



EVANS... Expects "significant share of PCM market".

## IDPM helps its members recruit

by Philip Hunter  
THE Institute of Data Processing Management is to help its members to recruit permanent computer staff. The institute will charge members a placement fee equal to 5% of the first year's salary for each programmer, analyst or data processing manager they appoint through the service.

Individuals who belong to the institute will also be able to use the service, called the IDPM People Placement Scheme, to find jobs. The institute aims to build a register of available staff along the same lines as recruitment agencies, to match applicants with jobs.

The register will be split into three categories: one for applicants in the £20,000 plus salary bracket; a standard category to embrace the majority of programmers and analysts, as well as DP managers; and a trainee category for graduates and people from government youth training schemes.

"We are offering to find the ap-

plicants and do all the administration concerned," says David Roberts, consultant at Igor Management, of Croydon, which is organising the scheme for the institute. "But we're not offering to discuss vacancies with employers nor to interview short-listed applicants."

Many of the recruitment agencies do interview and discuss vacancies. However, Igor is to offer a recruitment service, including technical interviewing, to supplement the scheme - at a fixed charge of £35 an hour.

This means that the cost of hiring someone for a salary of £15,000 would be around £1,100, assuming a day and a half of interviewing and consulting. This is less than 10% of the first year's salary, and considerably less than the established agencies charge, according to Roberts' calculation.

The service is also open to the 2,000 individual members of the IDPM, who might want a job.

## Data General pays staff to fill vacancies

MINICOMPUTER manufacturer Data General's UK operation is offering its staff up to \$1,000 if they provide leads to fill vacancies. There is also a special bonus quoted in Sterling of £250 to staff referring sales executives joining from Digital Equipment Corporation, Hewlett-Packard and Prime.

Data General employees get \$750 for referring systems engineers, field service engineers, technical support and repair centre engineers and sales executives, and \$1,000 for each subsequent referral. Lower bonuses are offered for

employees recommending clerical and secretarial staff.

"We find that when people are recommended by our employees, they stay, are more productive and fit in well," explains Data General's UK and Ireland general manager, John Dougall.

In order to get the cash award, the recruit has to be on Data General's payroll for six months. At the end of each fiscal year employees who have found recruits get another chance for extra cash, as their names are put in a draw for a \$600 and a \$400 prize.

## Word firms dig deeper

by John Riley  
TWO traditional word processing companies announced last week that they are pushing deeper into the information processing market.

Wordplex launched its 8000 Integrated Office System, which allows up to 24 terminals and 24 printers to share a 900 Mbytes hard disc storage.

On the same day, and at the same venue - the Info 84 exhibition at the Barbican - CPT Corporation announced its SRS 45 shared resource system, which allows up to eight terminals to share word and data processing files on a 30 or 60 Mbytes hard disc, and also Phoenix, its new chip-packed information processor.

The Wordplex 8000 system, which uses Wordplex's proprietary Gemini operating system, is the fruit of three years R&D.

"This is not insignificant froth," says Wordplex's chief executive Harry Mathison, "it represents the broad architecture on which we are basing our future, and will

allow users to upgrade painlessly and migrate to more cost effective technology."

The 8000 is based on a 16-bit Zilog 8000 processor and offers up to one Mbyte of main memory, and has five built-in managers slots to control workstations, files, printers, applications and communications. A medium configuration price works out in the region of £20,000.

CPT's shared resource system is based on a Zilog Z80 chip running at four MHz, and the basic price for 30Mbytes version is about £6,000. CPT's Phoenix system has two eight-bit chips - Intel's 8085 and 8041 - and three six-bit chips - Intel's 8086, 8088 and 8089. The Phoenix, which costs around £17,000, allows merging of text, data and graphics.

"The Phoenix won't supplant our current 8500 series," explains CPT's UK managing director, Kathy Devany, "it will work alongside our earlier systems and will support the development of advanced applications and software features for years to come."



DEVANY... Confident for years to come.

## How to export more

by Nuala Moran  
THE British Council wants exporters to know that it can help them get business overseas - as it has already for ICL on a £500,000 contract in Singapore.

ICL was contracted by the government of Singapore to develop a centre for computer studies at Ngee Ann polytechnic.

According to Ashok Hegde, manager of strategic planning at ICL: "Singapore wanted an integrated solution, that is it didn't just want pure training or academic standards or systems. By coordinating resources with the British Council we ended up with a unique package which the Singapore government had no option but to take."

The council recruited people from the UK to teach at the centre and arranged training in the UK for Singaporeans who will eventually staff the centre. Hegde explains ICL's view: "The UK leads in offering high value added services. Training is critical to this."

Bill Harvey of the educational contracts department at the British

council says: "There is a growing emphasis by overseas governments and international lending agencies on training which is integral with projects as opposed to stand education of ad hoc on-the-job training."

"A number of companies bidding for large contracts find themselves suddenly confronted with training demands. We can help because we have links with universities and institutes, we have specialist staff and we have a network of overseas representation in 81 countries."

"This puts the council in a very strong position to help UK companies organise training." Adds the Skills Gap, a brochure which explains the services the British Council offers, is now available. The science and technology group of the council is also helping to promote the Micro in Education Programme. In conjunction with ExportIT it has helped set up exhibitions in Saudi Arabia, Spain, Italy and Germany.

\* Available from The British Council, 11 Spring Gardens, London, SW1A 2NN.

## BT approvals board comes up for appraisal

by Donald Kennett

BRITISH Telecom's equipment approval board is up for appraisal itself, just as it has moved into gear in authorising telecommunications kit for attachment to BT's network.

Consultancy Brian James is to report on the British Approvals Board for Telecommunications approvals procedures to the Department of Trade and Industry within the next few weeks. Suppliers have complained of delays and the cost of gaining the board's approval.

The board had only one extension telephone to its credit for most of last year, but the number of approval certificates it has issued reached 16 last month. And a growing number is in the pipeline.

Director John Vevera is not entirely satisfied. He says: "Things are moving, but I would like to see them moving a lot faster. I have yet to get it into top gear."

The approvals board was set up in May 1982 as a result of the British Telecommunications Act 1981 to pave the way for companies to sell telecommunications equipment on the open market. But it has suffered a string of problems.

At the request of ministers, it was geared up to meet a very much higher level of demand than has materialised. The seven-strong engineering team has not been idle, because there has been plenty of work to do in re-working the standards specifications produced under pressure by committees of the British Standards Institution; re-writing test equipment software to accommodate the modifications; and managing the Department of Trade and Industry's interim approval schemes.

"It has also been developing its own schemes for equipment not covered by standards, for example telex and cellular radio. Vevera elucidates: "We recently announced a scheme for telex equipment. For cellular we shall be issuing a schedule (standard) produced by a group set up under the auspices of the Department comprising representatives of equipment manufacturers, operators, BT, the government and ourselves - all the interested parties. Ultimately it will be covered by this like yesterday."

"The interim approval scheme for telephones took the cream off the milk. There was a spurt where everybody rushed in and got cracking. That ended late last year. But our income is derived in three parts, what we add to this fee if someone else is doing it for us, the factory inspection fee and the certification fee."

This work has not been producing sufficient income, Vevera says. "The interim approval scheme for telephones took the cream off the milk. There was a spurt where everybody rushed in and got cracking. That ended late last year. But our income is derived in three parts, what we add to this fee if someone else is doing it for us, the factory inspection fee and the certification fee."

The organisation was set up with a £200,000 loan from the government, the industry and BT. But that was very rapidly spent. Vevera says: "It has now negotiated an interest free loan of another £200,000 from the government (using its self-supporting, as well as the sophisticated test equipment needed for cellular radio)."

The loan has approved so far include one 2,400 bit-per-second modem and two versions of STC's

Executec "complex telephone". The rest are simple telephones and plugs.

Other modems are in the pipeline, some of them associated with microcomputers, either as integral parts or as add-ons or stand-alone devices.

"We may have to check microcomputers," says Vevera, "because the modem will be a board inside it and the micro itself will run network addressing software, so it could be regarded as a direct attachment. About 70% of the job is done in the modem and 30% in the micro."

"If we have to deal with computers in respect of the statutory marking order, we can also offer safety approval through BEAB (British Electrical Approvals Board), which is voluntary."

"We may get more involved with indirectly attached equipment. There is a special regime still being worked out by the Department and the industry. A lot of data communications stuff is indirectly connected to the network."

A continuing problem the board faces is recruiting good engineers. "It's a very slow business, recruiting professional engineers," Vevera says. "Also we are wide open to our staff being head-hunted by the companies they are testing equipment for."

This has happened already, with one of the funder engineers leaving.

In the case of the interim schemes we don't do factory inspections, nor the certification, the Department does. That doesn't leave much for us, but we are still spending money on setting things up."

"There will probably be a further spurt next year when the prime instrument policy ends (the rule that BT must be the supplier of the first telephone on any exchange line). We think that will give a substantial boost to the market and to our work."

The board is currently running interim approval schemes for dealer boards (used by money market dealers and access servers at the same time), key telephones and extension telephones for use with PABXs. It has no scheme for PABXs themselves, Vevera says, because the appropriate standards have yet to become available.

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Other modems are in the pipeline, some of them associated with microcomputers, either as integral parts or as add-ons or stand-alone devices.

"We may have to check microcomputers," says Vevera, "because the modem will be a board inside it and the micro itself will run network addressing software, so it could be regarded as a direct attachment. About 70% of the job is done in the modem and 30% in the micro."

"If we have to deal with computers in respect of the statutory marking order, we can also offer safety approval through BEAB (British Electrical Approvals Board), which is voluntary."

"We may get more involved with indirectly attached equipment. There is a special regime still being worked out by the Department and the industry. A lot of data communications stuff is indirectly connected to the network."

A continuing problem the board faces is recruiting good engineers. "It's a very slow business, recruiting professional engineers," Vevera says. "Also we are wide open to our staff being head-hunted by the companies they are testing equipment for."

This has happened already, with one of the funder engineers leaving.

In the case of the interim schemes we don't do factory inspections, nor the certification, the Department does. That doesn't leave much for us, but we are still spending money on setting things up."

"There will probably be a further spurt next year when the prime instrument policy ends (the rule that BT must be the supplier of the first telephone on any exchange line). We think that will give a substantial boost to the market and to our work."

The board is currently running interim approval schemes for dealer boards (used by money market dealers and access servers at the same time), key telephones and extension telephones for use with PABXs. It has no scheme for PABXs themselves, Vevera says, because the appropriate standards have yet to become available.

The organisation was set up with a £200,000 loan from the government, the industry and BT. But that was very rapidly spent. Vevera says: "It has now negotiated an interest free loan of another £200,000 from the government (using its self-supporting, as well as the sophisticated test equipment needed for cellular radio)."

The loan has approved so far include one 2,400 bit-per-second modem and two versions of STC's

## UK distributor markets top Spanish system

by John Riley  
MOORGATE-based distributor Sisco is to market one of Spain's top selling systems in the UK because it is convinced that Spain will become a major micro-maker of the future.

Called the Business Express, the systems are built in Spain by Secoinsa (Sociedad Española de Comunicaciones e Informáticas), the government-owned commu-

nications agency in which Fujitsu has a stake.

The dual processor system, which has a Zilog Z80B and an Intel 8088 chip, supports the Oasis operating system, as well as CPM and MS-DOS.

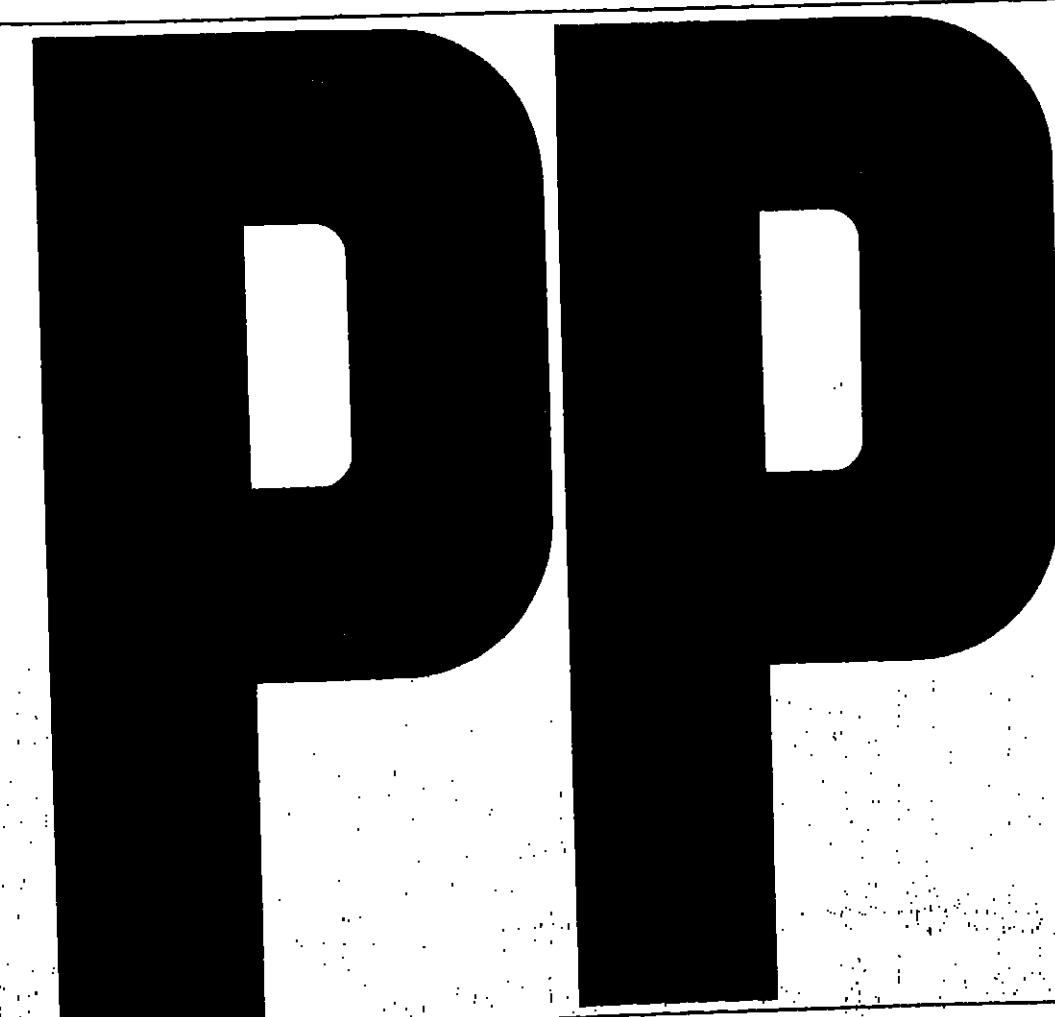
Patrick O'Brien, sales director for Sisco (Small Information Systems Company), believes that the Oasis operating system still has a big future.

"Since 1979, several thousand Oasis machines have been sold in Spain. Spain has standardised on Oasis, and the best brains in Spain end up in Secoinsa."

Sisco places much importance on the long viability of the Spanish-built Business Express. "Very few distributors are offering their dealers a profitable future that allows them to do the job of installing business computers properly," says O'Brien.

"I equate Secoinsa with the Japanese car industry of 10 years ago," he adds. "The company puts a lot of effort into quality control."

Sisco has already interested 18 Oasis systems houses in the machine. According to O'Brien, a typical configuration including four screens, business software and two printers, costs around £20,000.



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# HP chief attacks US chip makers

by Keith Holder  
US SEMICONDUCTOR manufacturers have been slammed by mini and micro maker Hewlett-Packard over the reliability of their memory chips.

Robert Frankenberg, the company's general manager for computer systems, has pronounced that Japanese chips are up to three times more reliable than the US equivalent.

He says that "despite significant efforts on the part of the US chip makers to improve product quality, the Japanese are still ahead."

This is in contrast to statements made last year by the company to the effect that the US products were up to scratch and were running neck and neck with the Japanese.

Frankenberg's statement has taken some Hewlett-Packard executives by surprise.

In a recent news release Franz Nawratil, general manager for data systems, confirms that US

suppliers are able to meet specifications for reliability.

He adds: "The reason the Japanese have been first to qualify with the company is that they have made their devices available first."

"The scenario governing our use of 64K RAMs showed this, and I don't foresee any reason why it should be any different with the latest 256K chips," he says.

Hewlett-Packard buys 64K chips from eight companies at present, four Japanese suppliers and four US suppliers.

A company spokesman says that the comments made by Frankenberg and Nawratil might differ because they were working on different ranges, where reliability requirements could differ significantly.

He adds: "Although the company is continually looking at the quality of components used in our machines, we would not make a hasty decision, or cancel purchase

orders on the strength of one statement."

In the race to qualify with the company with 256K dynamic RAMs (DRAMs), three Japanese firms have already crossed the line, while the US companies have yet to score.

Quality aside, the Japanese have been steadily gaining market share with their memory devices to the point where last year they achieved 46% of the world market, according to market research company Dataquest.

The spokesman said that previous pronouncements had been taken seriously by the US industry, and that Frankenberg's statement could be a tactic to spur it into making further efforts to "deliver the goods" more quickly.

He admits that this might be difficult as the current high demand for chips is keeping all the major manufacturers running at full capacity, and making them sell more devices than they can make.

## Micro buys cut-price disc drives

MICRO Technology of Telford, Wells has signed an agreement with General Automation to buy £1 million worth of the Alpha-10 mini-cartridge disc drives for which General Automation is exclusive main distributor outside the US. The drive at this size of order has enabled the company to cut the end-user price of its Honeycomb 20MByte drive packages by £555 to £338. The drives are designed for the IBM-PC market.

## Stearns supplier

AM INTERNATIONAL, the US multinational manufacturer of printing machines and phototypesetting equipment, is to distribute the Stearns 16-bit micro in the UK. Popular in the US, the Stearns micro is Intel 8086-based (running at eight MHz) with optional 8087, has 128 Kbytes RAM, expandable to 896 Kbytes, and offers CP/M 86 and MS-DOS operating systems. Prices start at £2,500.

## Denton to China

BOB DENTON, managing director of Sinclair distributor Pace Holdings, is taking a party of peripherals and software suppliers to China next month. "China is very hungry for British products," he says, "but it took Sinclair four months to get government approval to export there. The Americans are exporting 16-bit micros to China now, whereas we're having trouble with anything over eight bits and four MHz."

## Intelsat contract

THE international satellite communications organisation Intelsat has contracted for \$1.2 million worth of computer system analysis, design and development work by Computer Sciences of the telemetry, tracing and networking facilities of the Intelsat VI series of satellites that are due to go into service in 1986. The contract has renewal options that could be worth \$4.9 million over three years. Intelsat VI will have double the capacity of Intelsat V, more than 30,000 telephone circuits.

## Masterline public

PLESSEY's Masterline key telephone system, which handles up to six lines and 16 extensions, has been approved for connection to the public network under the Department of Trade and Industry's interim approval scheme.

## Dataquest inquiry

CALIFORNIAN information technology market research company Dataquest is to conduct a joint programme with its parent company, A. C. Nielson, to investigate the personal computer consumer market, and will monitor 20,000 households quarterly. Dataquest is also soon to expand its UK operations to include services to cover the printer and telecommunications industries.

## VLI sponsorship

THE business microcomputer category of the 1984 British Computer Awards will be sponsored by the VLI group of computer staff recruitment agencies. VLI says the decision to sponsor the award follows two independent surveys which found that the use of microcomputers in business was of major interest to programmers and DP staff seeking new jobs.

## Finar system

FOLLOWING the article on software distribution in the February 16 edition of Software Monthly, we wish to make clear that Corporate Modelling Consultants Limited develops and markets the financial modelling system, and not the Final system.



STODDART... Estimated only 300 GPs use micros.

## System will speed up drugs reports

by Nuala Moran  
A SYSTEM to speed up the reporting of adverse drug reactions is being developed by Baric Computer Services in collaboration with the medicines division of the Department of Health and Social Security.

The sum of £25,000 has been made available to develop the system, which will initially collate drug side effects reported by 3,000 participating GPs.

A DHSS spokesman says: "The average GP probably reports about half a dozen reactions a year, so we won't be providing terminals just for that. But obviously there are lots of other applications coming along, and the DHSS wants to make sure the drug reporting and other applications are standard."

In fact there is a long way to go before all doctors are using a micro. In a survey published last week Dr Norman Stoddart, ICI computer fellow, estimated that only about 300 out of the country's 25,000 GPs use a micro. And he showed that doctors are using their

micros for paperwork, rather than for diagnostic purposes.

Of those GPs using micros, 40% use them for repeat prescriptions, 34% for age/sex registers and 34% for patient recall. Only 8% are involving the computer in doctor/patient consultation for diagnostic purposes.

The DHSS spokesman says that the department also wants to see micros used in preventive medicine, such as monitoring repeat prescriptions, calling in patients for vaccinations or cervical smear tests, and eventually for drawing up health statistics.

Doctors wishing to get into micros have to pay for the equipment themselves, though they can get assistance from the GP's Finance Corporation, which exists to help with finding premises and providing office equipment.

Stoddart criticises this scheme because it limits the choice of micro to two British makes. According to Stoddart, this means that they cost more than other micros on the market.

# Telecomms Bill survives Lords

by Dave Madden

THE government has steered the Telecommunications Bill through its committee stage in the House of Lords relatively unscathed, despite a rough ride from the telecommunications equipment manufacturing lobby.

It was only defeated on amendments to safeguard rural services and on the issue of telephone tapping only, although the Bill will face further amendments when it goes into report stage in March.

The telecommunications industry's objections to the Bill have centred on British Telecom's licensing arrangements, the prospect of BT looking to foreign equipment suppliers at the expense of the domestic industry, and the issue of BT's right to manufacture.

Dealing with the licensing arrangements, Lord Cockfield, Chancellor of the Duchy of Lancaster and the minister in charge of the Bill, said that the government would table an amendment for the report stage of the Bill, providing

that, before a public telecommunications system came into force, the text of the licence authorising the running of the system should go before the Commons.

On British Telecom's right to manufacture equipment, Lord Mackay of Clashfern, the Lord Advocate, said that the government accepted the distinction between running a public telecommunications system and manufacturing apparatus for it. Manufacture by an operator should be in a different company from that which ran the network.

The government is to put that policy into a condition of the draft licence.

The government also believes that there should be a clear prohibition of cross subsidies between the two activities.

At the same time, Lord Mackay stressed that the government wanted to encourage BT to involve itself in research and development. Lord Weinstock, managing director of GEC, objected to the

government's insistence that the Bill should provide adequate safeguards for the home telecommunications industry. Lord Bruce of Donnington, chief opposition spokesman, said that Labour peers would table an amendment to provide specific protection for British manufacturers of telecommunications equipment at the report stage.

The Bill goes into report stage in the House of Lords on March 12, and the Department of Trade and Industry expects it to receive a third reading before the end of March, and to go back to the Commons in April.

The government is set to change the law to relax the rules of the £4 billion British Telecom share flotation this autumn. It is disapplying sections of the Prevention of Fraud (Investment) Act and the Companies Act of 1948.

The application forms due to be sent to BT's 17 million individual telephone subscribers will not be accompanied by a full prospectus, that would be too expensive.

## Xerox in US cuts Star price

XEROX in the US has knocked a third off the price of its Star workstation and brought in two cheaper versions for standalone and remote operation. The price of the original Ethernet version is now \$9,995, rather than its previous \$15,000.

Rank Xerox in the UK has not announced plans to follow suit.

Star was launched in 1981 and it pioneered features such as the mouse for cursor control, symbolic "icons" for file management, multiple "windows" for task management and the bit-mapped screen for high-resolution graphics. These features are being taken up enthusiastically by other micro makers, most notably Apple with Lisa and Macintosh. But Star has not sold in large numbers and the company admits that price has been a factor.

Apple's Lisa, which closely follows the Star model, suffered the same problem. When its baby brother, Macintosh, was launched in January, a new Lisa version was announced at less than half the original price.



HIGGINS... "The Compass is not a sewing machine."

## Space micro unveiled

by John Riley  
CALIFORNIAN micro maker Grid Systems last week launched its 16-bit portable microcomputer which weighs in at just under 11 pounds, including a flip-up electro-luminescent flat screen.

Called the Compass, the micro has already been up in the Space Shuttle twice, has been used by the US marines in Grenada and Beirut, and is used by 400 US government tax fraud investigators.

The machine has an Intel 8086 chip and also an 8087 arithmetic handling chip, and offers 256 Kbytes of RAM and a further 384 Kbytes of bubble memory for \$5,195.

An Intel 80186-based Grid Server links up to 44 Compass micros, including 12 ports for telephone downloading. A typical Grid Server capable of supporting 16 users costs around £20,000.

"This is not a sewing machine," says Roger Higgins, Grid's vice-president for international sales, drawing attention to the growing band of manufacturers who are

calling their machines portable. "If you can't get it in a briefcase, can't drop it or if it needs an external monitor, it isn't portable."

Higgins does not mind if the Compass is dropped: "It will survive a force of 135 g," he explains.

A military version, which conforms to the US Defence Department's Tampest specifications, is also available. That version is two pounds heavier than the commercial version, and has 512 Kbytes of RAM and an internal fan and filter for the screen. This version has a US base price of \$10,500.

The commercial version is being distributed in the UK by Theme Systems, which also distributes the Onyx microcomputer.

Grid was founded in 1980 by Englishman John Eilenby, who was formerly with Xerox. Initial investors included Gene Amdahl, and Ray Williams, founders of IBM plug-compatible mainframe manufacturer Amdahl, and also by leading figures in non-stop microcomputer company Tandem. Grid has sold 4,000 in the US.

## NGA joins newspaper study

by Nuala Moran  
A STUDY is to be set up by the NGA and provincial newspaper owners aimed at helping the two sides reach agreement on the introduction of new technology.

National Graphical Association members and representatives of the Newspaper Society will supervise the study which will analyse copy input at provincial newspapers.

Norman Walker, deputy director of the Newspaper Society, says: "We will be looking at about 12 to 14 different types of copy, from classified adverts to editorial copy coming over the wire."

"From this analysis, we will be able to draw certain conclusions about how much copy can be put directly into computer-run typesetters."

The proportion of copy which could be put directly in by editorial or advertising staff will vary depending on staffing levels. For this reason the survey is looking at five different newspapers, thought to be representative of the industry as a whole.

The survey is part of Project Breakthrough, which according to Walker is "a scheme of education and persuasion for management and employees to draw to their

attention the need for the industry to make the most sensible use of new technology."

"The project is timed to run from 1982-1984, by which time we hope to achieve an agreement under which members will be able to negotiate their own local agreements for new technology."

Walker adds: "This study means we are making full and sensible use of new technology."

Results of the survey, which will be complete in April, will be made available to the other interested unions, the general print union, Sogat '82 and the National Union of Journalists.

## Technology for Business succeeds

TECHNOLOGY for Business, the peripheral distributor and legal systems specialist has reported encouraging 1983 results - its first as a public company.

In the year to December 31, 1983, the company returned pre-tax profits up 28% at £312,000, on turnover marginally ahead of £2.48 million. That exceeds the forecast it made in its prospectus by 15%.

Technology for Business was formed in 1981 from the UK subsidiary of Logabex, which was twice rescued by the French government. Greene & Co brought it to the Unlisted Securities Market last July via a 66% under-subscribed offer for sale at 100 pence.

Chairman Paul Bion says: "We've put a lot of effort in the last two years - we have grounds for optimism in 1984."

The company used the cash raised from the market to buy business micro maker Five Technology last November.



BION... "Grounds for optimism in 1984."

## CMG forms six new companies

COMPUTING services house CMG has undergone a reorganisation to mark its move beyond its traditional bureau base.

The £27 million per year group has formed six new companies, mostly in specialist fields, to give it a total of nine operating companies in the UK. The company also has operations in Holland, Belgium and Germany, which bring in over half its revenue.

Ron White, CMG joint managing director, says: "We think this is only the start of our reorganisation. We think that we will be

establishing more vertical market companies starting with one for manufacturing in 1985."

He points out that now over half of CMG's turnover comes from consultancy work such as feasibility studies and systems development and programming, and that the rest comes from information processing and the sale and support of software products.

The company's bureau services are to be centralised at its Croydon headquarters, supported by four regional centres under CMG in-

formation Processing Services. The group has set up two new consultancy companies based on existing subsidiaries: CMG Information Consultancy Services Central London and West London, respectively. These will specialise in management consultancy, systems design and analysis and programming.

Two vertical markets for the motor trade and for various types of associations will be handled by CMG Information Services for Associations and CMG Information Services Motor Trade.

## data processing

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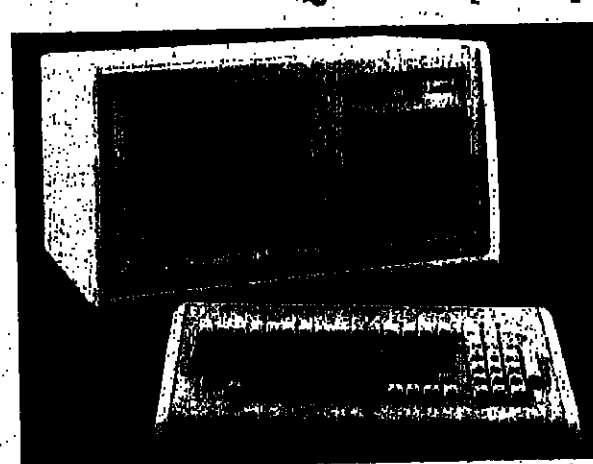
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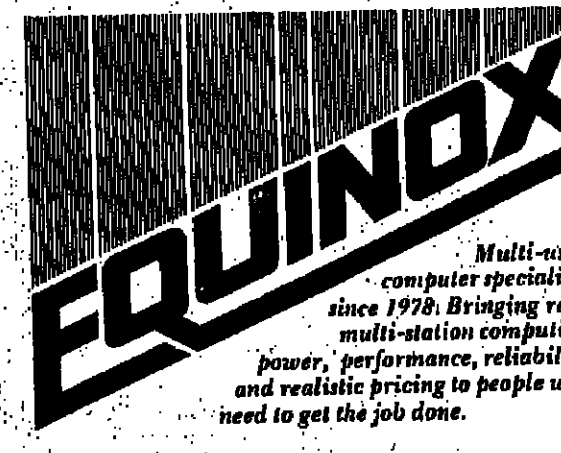


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# Cellular radio makes an explosive impact on the 80s

Enthusiasts already envisage wrist phones for the masses and portable pocket telephones, says Bohdan Szuprowicz

CELLULAR radio services, the first of which went on the air in Chicago last year, are seen as one of the fastest growing and most lucrative businesses in communications, and are expected to develop into a multi-billion dollar industry before the end of the decade.

Enthusiasts already envisage wrist phones for the masses and portable pocket telephones, but more astute industry analysts see it primarily as a business service. Monthly subscription costs are in the order of \$150 and although these may come down to about \$70 in a few years it will be hard to beat the ubiquitous pay telephone even if it costs 25 cents for a local connection.

Cellular radio technology is primarily designed to provide many more simultaneous conversations for mobile telephones than the 23 New York City, for example, the conventional mobile telephone service handles about 700 subscribers who already experience considerable delays. Introduction of cellular radio could increase this to 100,000, eliminating delays and offering more reliable service and clearer reception.

The key to cellular radio technology is the central computerised automatic switching system within a metropolitan or rural area in which the service operates. The whole area is divided into cells each of which contains a base station transmitting only to radio telephones within its boundaries.

As you move from one cell to another your conversation is automatically switched to the next base station by the central switching system. This allows many more

**Within the next two years cellular radio services will be available in most of the 30 largest metropolitan areas of the US**

calls to be handled within the area which, theoretically, could always sub-divided into more smaller cells providing almost unlimited capacity for the system.

1984 is the first full year of cellular radio service in the US and industry estimates put the initial number of subscribers at about 15,000 in the first year increasing by 500% to 90,000 in 1985.

Initial revenues from cellular radio service are not expected to exceed \$30 million but are projected to rocket by over 480% during the year.

This growth will slow down later but will average about 86% a year during the 1980s. Link Resources forecasts 1,360,000 subscribers by 1990 and yearly revenues from cellular radio services of over \$1.1 billion, but other projections expect even more explosive growth to about 2,000,000 subscribers generating \$3.6 billion in revenues.

Still other studies suggest 3,000,000 subscribers by 1990 paying a total of \$6 billion for the services, and by the year 2000 the revenues of the overall cellular telephone industry are estimated to exceed \$30 billion.

Such a huge potential market attracted dozens of communications carriers originally headed by AT&T racing to acquire operating licences from the Federal Communications Commission and about 20 hardware manufacturers supplying the equipment needed to operate cellular radio systems.

Sales of switches, control stations, and mobile telephones are expected to boom in 1984 at about \$800 million but will peak at over \$1 billion in 1986 when the bulk of initial installations will be in place.

Within the next two years cellular radio services will be available in most of the 30 largest metropolitan areas and most other areas of the US are expected to have the service before the end of the decade. But, despite this rapid growth and potential steady revenues the cellular radio industry presents relatively limited investment opportunities and did not attract as much venture capital as some of the other high technology areas.

This is because cellular radio is basically a highly regulated industry, initial equipment costs are relatively high, and there are still many uncertainties about the profitability of such enterprises.

The FCC grants two licenses each Cellular Geographic Area of which one is reserved for the local telephone company which any independent operator will have to compete with. As a result for a real area there are 180 licenses.

This means an average of only about \$5 million per licence in an overall billion dollar market when and if it develops by the end of the 1980s.

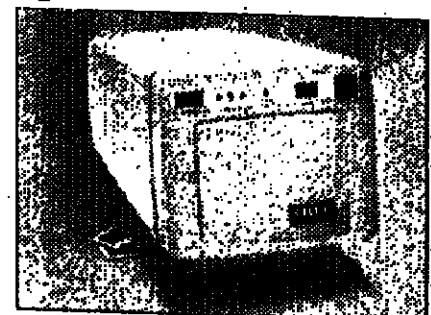
Given those limitations independent cellular radio service firms using highly efficient switching equipment may see good investment potential in their growth beyond the explosive phase will be limited acquisition of other services, consolidation of other services, American Cellular Systems, Cellular Communications, Cellular Scanning, Millicom, and Cellular Communications are some of the companies in this category.

Perhaps the best investment potential in the shorter term lies in the cellular radio equipment manufacturing firms which supply the specialised equipment to get the industry on its feet. American Cellular Networks, Cellular Technology are examples of small newcomers in this business, but the bulk of revenues will most likely come from the coffers of big established telecommunications manufacturers and the Japanese.

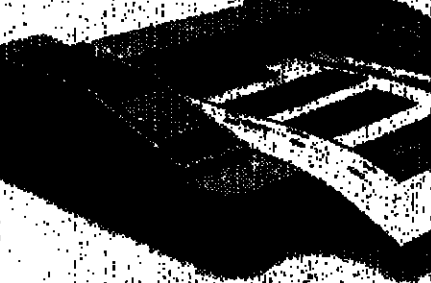
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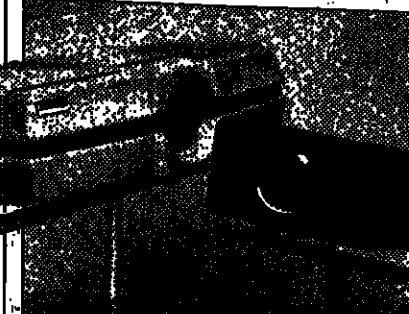
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## EDUCATION

Graduates in information technology are now in the making at about 20 UK polytechnics... John Kavanagh reports

# A degree of respectability for computing

THIS time last year John Sherwood was running a computer centre; now he is senior lecturer on BSc and MSc degree courses in information technology at Leicester Polytechnic. For suddenly information technology has become eminently respectable in higher education circles.

Last October about 20 polytechnics, with full backing from the government, introduced information technology degree courses alongside their more traditional computing science and electrical and electronic engineering courses.

The idea of these new degrees came up in 1982—designated Information Technology Year by the government. Some 25% of the funding went to just one of the 20 or so polytechnics: Leicester. This was because it already had over 80 staff in relevant disciplines such as computing and engineering, strong links with industry and some extremely advanced research work going on.

It is one of the UK's leading centres of research into communication between humans and machines, both in the office and

machine interfaces and so on.

There has been no problem finding companies to take on the 40 MSc students for the four months they spend on an industry project as part of their course.

Students have come from all disciplines to join the courses. Undergraduates must have one physical science subject at A-level or the equivalent. MSc students can come from any background, although they must prove they can absorb technological ideas.

Only four of the 40 MSc students are women in this first year of the course. "It's very disappointing. There's no reason why women should not be just as successful as men."

The courses are run jointly by the schools of electronic and electrical engineering, mathematics and computing. Undergraduates study software engineering, database and data handling, microcomputing, man-machine interfaces, communication and networking, including the integration of voice and data communication, plus information technology applications.

MSc students cover broadly the

**This network has not been thrown together, with cable and sticky tape everywhere**

the factory. On the microelectronics side it has a high reputation in voice input, image processing and factory plant control.

Sherwood is one of a dozen new staff taken on to run the courses. They include people from industry with no teaching background. In addition some teaching is done by existing staff in related disciplines.

Sherwood describes the eventual graduates as information technologists. "They will have an overview of what is going on in an organisation and will advise their management on the broader aspects of computing," he says.

"Usually these are separate and the people involved in each one don't talk to each other. But the convergence of computing and communications means there are tremendous opportunities just waiting to be seized by management, to the overall benefit of the organisation."

There is no threat to computing science people or engineers. "Specialists are very important," Sherwood says. "We need the computing scientists and the electronics engineers to design the computers. They have, in-depth knowledge of specific areas."

"The information technologist has a broad knowledge of computing without going into such nitty-gritty detail, plus an understanding of how the company or organisation works."

"For example, there is a strong software element in the course, but we stress the idea of software engineering. Our students learn how to produce robust systems which are properly designed and constructed and which have proper documentation so they can be maintained by other people."

"They learn a lot more than how to program in a particular language; they have to appreciate the environment in which it will be used and look beyond the programming department to the wider needs of the organisation; man-

same areas, plus project skills and hardware. The emphasis is very much on computing and communications: MSc students spend three hours a week on each of hardware, communications and software engineering, plus two hours each on database and man-machine interfaces.

Much of the course time is spent using equipment. There are synchronous and asynchronous terminals and a wide range of microcomputers all around the school of electronic and electrical engineering, linked by an Ethernet-type local area network.

Two Case DCX data switches have been installed. They interface the local area network to a variety of other devices, including a videodata terminal and a telephone channel simulator for demonstrating telephone traffic. The DCXs stand next to each other, but are linked by a wide area network so one of them can simulate a remote site.

Plans include linking in a Digital Equipment PDP-11/60 minicomputer, which is used for image processing, plus a new PDP-11/23.

This network has not been thrown together, with cable and sticky tape everywhere. "It's tempting to do it all on the cheap," says Sherwood. "But our students are going out into industry when they leave here. We've set them a good example by creating a well-engineered physical environment, with proper cabling, trunking, furniture and so on."

The first MSc graduates in information technology will come on the jobs market this year; BSc people will start appearing in mid-1986. They are expected to find jobs initially as programmers, database administrators, network supervisors and hardware technicians.

Some are specialist jobs, but Sherwood says that because of the graduates' broad knowledge they

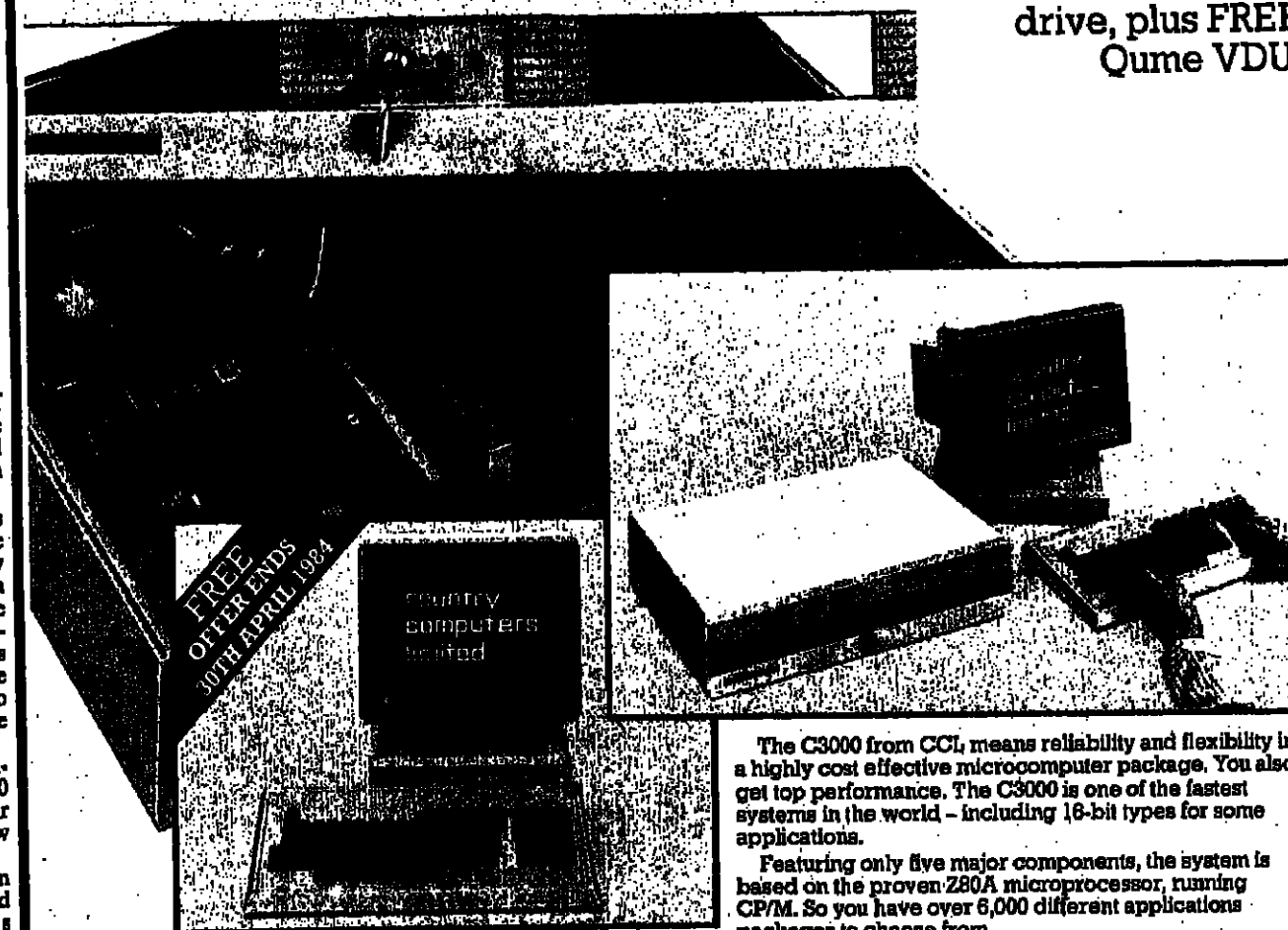
will have far greater potential for taking on more general roles in information technology.

This takes him back again to the emphasis on the practical. "People who promote information technology often have a vision of a more prosperous and interesting future for society, with homes and businesses linked by networks carrying sound, image and data traffic," he says. "We want our graduates to have vision—but we also want them to have jobs."

SHERWOOD... "We want our graduates to have vision—but jobs as well."

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## SECURITY

Computer swindles are costing British industry up to £2.5 billion a year . . . Peter Smith looks at prevention

# How to win this costly war against electronic fraudsters

THE need for communications security has been with us in one form or another for a very long time. In the Middle Ages, a messenger would commonly bring with him a token known to be the property of the sender in order to confirm the authenticity of the message. Codes and ciphers have been used since the earliest times to make the contents of a message unintelligible to any but the intended recipient.

The invention of the electric telegraph in the last century brought a new dimension to this problem. Now any engineer could tap the line and read and record the data transmitted on it with comparative ease and, given reasonable care, in complete safety and without fear of detection.

The possibilities for unauthorised access to and interference with electrically transmitted information have increased with every advance in telecommunications and computer technology. Now online systems with dispersed multiple terminals are common. It is in the banking field, which is already heavily dependent on electronic funds transfer, that the risks are most evident. The building societies, commodity dealers and similar operations will be similarly vulnerable as new technology is introduced.

In Britain, few such organisations currently employ stringent information security techniques as a matter of routine although the Midland Bank and Barclays Bank are understood to be experimenting with the American Data Encryption Standard (DES) technique.

The technology of the 80s may make the "office in the home" a reality. Unfortunately, it offers similar opportunities to those bent on electronic espionage and fraud. There are two sides to the problem. One is the risk that information which has a high value can be obtained by enemies or competitors — often without the knowledge of the owner. This is particularly relevant in government and defence and, in the commercial world where, for example, proprietary information relating to new technical developments, or plans for financial deals is involved.

**In designing a system from scratch, security should be considered from the outset, with the software selected, the cables run, and the terminals located in such a way as to minimise the risks**

The other risk, that of intrusion, is that information or data may be illegally inserted into a system in such a way as to mislead and influence the actions of a recipient or, in the case of a computer, to instigate a transaction of advantage to the perpetrator.

It is difficult to obtain hard facts concerning the incidence of computer fraud because the victims usually, and understandably, are at pains to avoid publicity for fear of losing customer confidence.

However, a recent *Daily Telegraph* report estimated that British industry is losing "anywhere between £500 million and £2.5 billion a year" in this way.

So what can be done to prevent



A messenger at NatWest Bank: still the most secure method of communication.

these abuses of modern technology and at what cost? As in many fields of endeavour, it is dangerous to generalise but, since no one would welcome publication of the specific security measures used to protect their information, there is no alternative. Readers should have little difficulty in relating the generalisations to their own situations.

In any engineering problem, it is necessary to define the user requirements and in the case of security this means assessing the threat. The old adage "you get what you pay for" holds good in most specialist fields, and information security is no exception.

There is little point in installing a system which would defeat the KGB in a situation where the real threat is that posed by an avowed technician armed with a home computer.

On the other hand, one should not dismiss too lightly what might be achieved by well-organised technical criminals using readily available, if expensive, equipment of considerable sophistication.

Threat assessment is not an exact science, and system users may feel uncomfortable about discussing the subject. It is, however, the only foundation on which a cost-effective information security system can be built. The alternative is to assume that anyone attempting to break the system will have access to the most advanced technology available. This approach of expecting the worst is rightly adopted in government circles at very considerable expense. In the commercial world, it is usually necessary to relate the costs of information security to real reductions in the cost of indemnity insurance or to estimated reductions in losses through fraud.

Having assessed the magnitude of the threat, the next step is to identify the points of weakness in the system.

These weaknesses? Clearly, in designing a system from scratch, security should be considered from the outset, with the software selected, the cables run and the terminals located in such a way as to minimise all the risks mentioned.

In the case of an existing installation, it is rarely possible either to replace everything and start again, or to remove the system from service for a significant period.

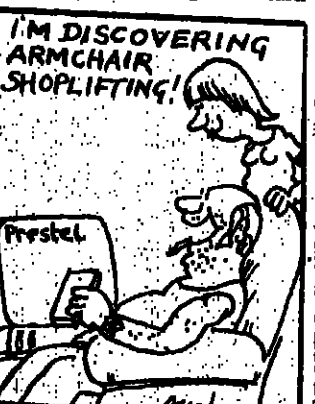
There are, however, a number of techniques which can be employed at moderate cost, to reduce very significantly the vulnerability of a system to either information loss or intrusion.

The most obvious way of preventing either intrusion or information loss by a wire tap lies in the use of encryption techniques. Much has been published on this subject in recent years, and systems managers might be forgiven for concluding, depending upon which technical journals they read, either that simple software algorithms can provide an acceptable level of protection, or conversely that no commercially available data encryptions are fully secure.

In reality, the adequacy of an encryption technique in a given situation depends upon the resources assumed to be available to those attempting to break the system in terms of both cryptanalytical expertise and computational power. If we accept the existence of the former, then the encryption algorithm must be such that its solution is computationally not feasible using the assumed resources, and within a timeframe determined by the nature of the information to be protected and the key period.

Thus, a relatively trivial technique could be quite acceptable to protect information of ephemeral value where the key is changed daily. Such a situation might exist in the case of a system controlling the movements of a fleet of security vans.

On the other hand, where the information is of long-term value (eg annually changing cash card



personal identification numbers or government and commercial stores) or it is not feasible to change the key frequently (eg in the case of a world-wide network), much more powerful algorithms must be employed.

The only theoretically unbreakable encryption system is that known as the "one-time pad". In binary form, such a system may be implemented by arranging to add to the message, bit by bit, a random stream of bits. A receiving end, a copy of the same random key stream must be held. Decryption is also achieved by adding the random stream to the key stream.

As long as the stream is truly random, at least as long as the message is never reused, the system is theoretically unbreakable. The main weakness in the

system lies in the need to control and distribute the key in a secure manner.

The term one-time pad arises from a popular, manual implementation in which pads of keys are held by users and each page is used once only.

Clearly, such a system would be very difficult to employ where large amounts of data are to be transmitted. Practical data encryptions therefore generally rely on complex hardware software algorithms to generate permutations and substitutions of data bits in an order determined by a periodically changed key (typically of up to a few hundred bits).

This algorithm either operates directly on blocks of data (block cipher) or generates a long pseudo random key stream which is module two added to the message stream (stream cipher).

A direct attack on such a cipher, assuming that the algorithm is known, requires that a key stream is generated for every possible version of the periodically changed key. These key streams are then matched against the cipher stream, using every possible starting point, until the original message stream is identified.

**Communications circuits are best protected by the use of fibre optics to replace conventional copper circuits**

It is worth noting that the development of a computer-based test for unencrypted data is itself a non-trivial problem. Weaknesses in cipher design or in the method of use may, however, lead to other ways of breaking the system.

The most commonly-used implementation is the stream cipher because the system can be designed in such a way that a single bit error in the cipher stream causes only a single bit error in the deciphered data.

The security depends on the pseudo random sequence, the design of which is a complex problem, and on the length and life of the key. These factors determine the computational power and memory size required to break the cipher in a given time by the direct approach.

To take an extreme example, it has been estimated by the National Physical Laboratory that if the solution requires the existence of  $10^{10}$  memory elements, the physical memory would occupy a space 10km high over the whole of the earth's surface.

If the principle concern is with the prevention of intrusion rather than information loss — and this may well be so in the case of a bank — authentication techniques can be very effective in providing the required protection.

The principle here is that whenever an attempt is made to access the system, an interactive authentication routine is initiated to confirm that the terminal in use is a member of the system (ie not an intruder) and, if necessary, that the user of the terminal is entitled to access. Authentication may take place at the start, the end or at intervals during a transaction.

Simple authentication systems may be implemented within the software both at the main computer centre and within the terminal. This approach, however, suffers from a number of disadvantages. It is necessary to verify the in-

tegrity of the software, including the main computer operating system.

Such a solution is difficult to implement once a system is operational, particularly if a number of different types of terminal are in use.

It is not possible to use standard terminals.

A preferable, high-integrity approach is to use authentication modules at the terminal location with a separate authentication controller interposed between incoming lines and the main computer system.

At the terminal location, the modules can be made tamper proof and they can, if necessary, be installed within a secure cage. At the main computer location, the authentication controller can, if necessary, be installed on the by-line basis so that the installation of authentication on an existing system can be achieved without major disruption.

Because neither the authentication modules nor the controller rely on the main computer operating system, the problems of installation of complex software packages do not arise. Such systems require the use of encryption algorithms.

A well-designed authentication system is often the best way of improving security on an existing system where intrusion is regarded as the main threat.

Protection of a complex system against the radiation of signal bearing information is both expensive and difficult to achieve. It is possible to deal at moderate cost with those parts of the system.

These are CRT-based terminals, printers and data circuits. In the case of terminals and printers, special versions are available with RF shielded housings.

Communications circuits are best protected by the use of fibre optics to replace conventional copper circuits. Fibre optic multiplexers, modems and line drivers are now readily available including RF shielded versions.

Another significant advantage of fibre optics is that the circuits are almost impossible to tap.

**There is little point in installing a system which would defeat the KGB where the real threat is that posed by an avaricious technician armed with a home computer**

The high bandwidth characteristics of fibre optics, and the maturity of the technology, now make it a preferable alternative to copper for many applications on grounds of price and performance alone, leaving aside the security issue.

The advantages of modern-day communications and computer technology are many. But there is no doubt that they put many organisations at risk, often without their knowledge.

Providing total security on such systems, particularly when originally designed with security in mind, may be extremely difficult and expensive. In most cases, however, it is possible to provide security integrity without dampening the system operation, and at costs which are trivial compared with the losses which could otherwise be incurred.

Peter Smith is marketing director of Systems Production.

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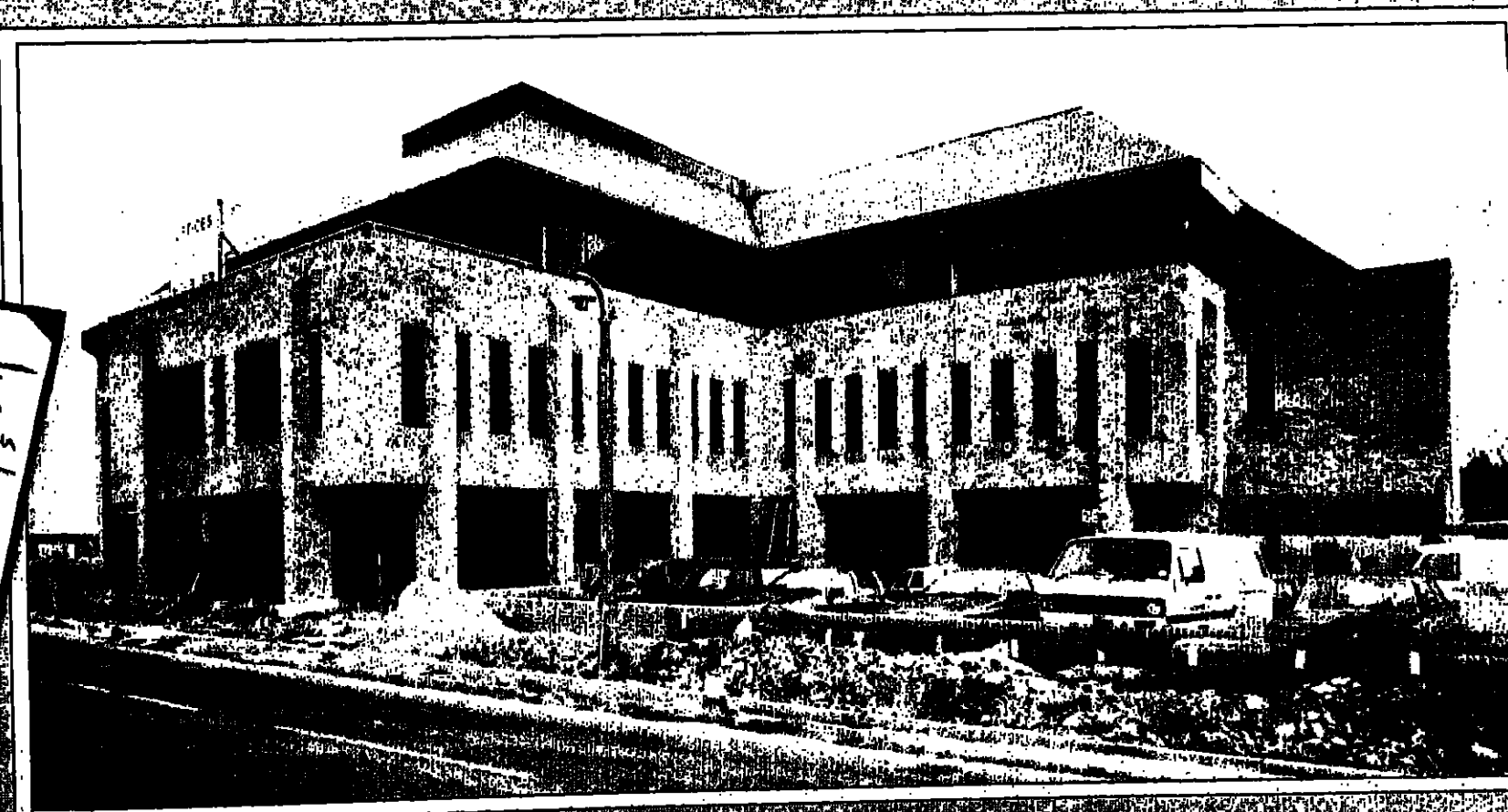
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# Let's get mailboxes moving

NCC's Paul Wilson says that its recent study on mailbox systems recommends immediate action

MAILBOX systems will have a dramatic impact on productivity and effectiveness and should therefore be implemented by UK organisations as quickly as possible. This is one of the conclusions of a recently completed study of mailbox systems jointly funded by the government's Electronics and Aeronautics Requirements Board (EARB) and the National Computing Centre (NCC).

This and a number of other conclusions are presented as a series of "recommendations for the effective deployment of mailbox systems in the UK" in an appendix of a new NCC publication *Introducing the Electronic Mailbox*.

Mailbox systems work by providing the individual with a personal mailbox through which messages can be prepared, sent, received and filed. Incoming messages are deposited and held in the mailbox until they are accessed at a time and place of the recipient's choosing.

The potential impact of mailbox systems on productivity was identified after investigating some of the most advanced user organisations. It is clear that when a mailbox system has permeated throughout an organisation, a new corporate culture starts to emerge.

This is characterised by less concern with processes and more concern with getting things done; delegation becomes more common and employees are more flexible and responsive; the demarcation lines within the hierarchy are broken down.

The net result of this changed corporate philosophy is more effective team working; better decisions based on more relevant up-to-date information; improved customer service and faster product development.

A survey of 34 mailbox products currently on the UK market was conducted in the course of the NCC study, and identified that most contemporary mailbox systems are designed to facilitate informal, unstructured communication such as that undertaken on the telephone. This kind of use

can benefit the individual by saving time, reducing interruptions and improving communications.

However, such benefits are intangible, difficult to measure and do not make a direct impact on an organisation's profitability. Alternatively mailbox communication can be structured so that specific tasks can be undertaken.

The study identified 13 different types of applications for structured mailbox systems including the control of branches, transaction processing, education and training, project teams and working parties, the running of meetings and communications between customers and suppliers.

Such experience that has been gained of structures to date, has indicated that there are many possibilities (the NCC study identified over 100 generic types) and that specific applications in particular organisations will probably require their own tailored structures. Hence there is a need for mailbox software which can be easily modified to incorporate new structures as the need arises. Workers in the field testify that this is not possible today and lay the blame on the lack of an appropriate programming language.

The product survey conducted in the study asks suppliers to estimate the number of mailbox users of their products. The results showed that there are about 105,000 users of these 34 products worldwide and that this figure is growing rapidly. However, when estimating total worldwide mailbox usage, it must be remembered that the survey did not cover two other, probably larger, components of mailbox usage.

These are: ■ Mailbox products not sold in the UK (and probably used mainly in the US); ■ Mailbox systems which have been developed internally by organisations for their own use.

Paul Wilson is senior consultant of the Office Systems Division at the National Computing Centre.

## Organisations and systems taking part in the international dissemination of mailbox recommendations on 11 January 1984

Organisation	System	No. users reached
Istel	Comet	40
Zynar	Zynar/Nestor network	120
Plessey	Internal Plessey system	150
Datapoint	Datapoint Electronic Mail Service	200
Texas Instruments	Texas Instruments Inc. MSG System	1,000
Mailnet	Mailnet	150
Computer Sciences	CSC Notice	1,000
Geisco	Geisco's Quik-Corn System	200
Milepost Business Systems	British Telecom NE internal systems	50
	Janet	300
	Arpanet	300
ICL	ICL internal systems	500
Bell Northern Research	Bell Northern Research Cocos	4,500
GMD	Komex from GMD (West Germany)	370
Rank Xerox	Xerox Internet	5,000
DEC	STSC APL plus SIG Icebox	200
	Digital internal (all-in-one)	100
NPL	Usenet	5,000
	NPL Scrapbook & Edit Systems	100
Hewlett-Packard	HP's internal HP Desk Manager network	2,000
New Jersey Institute of Technology	EIES at NJIT	200
I. P. Sharp Associates	I. P. Sharp Associates Mailbox	7,000
Prestel	Prestel Mailbox	31,000
Stockholm University Computing Centre - QZ	COM	2,000
NCC	NCC's Zynar network	20
	Blend	40
		62,730

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## NATURAL LANGUAGE

During his visit to the UK last week Jon Barwise spoke to Philip Hunter about his research into natural language

# Professor who brings the language of logic to life

PROFESSOR Jon Barwise of Stanford University, who has been given a \$21 million grant to develop a fundamental theory of natural and computer language, was in the UK last week to discuss his research.

After giving a talk at Imperial College, he usefully sidestepped a suggestion that he had qualms about the logical basis of Prolog, a language now being used for development of artificial intelligence software. And it would have been more forthright about Prolog, since his host was Bob Kowalski, one of Prolog's pioneers.

To set the scene, Prolog is a so-called logic language ideal for describing relationships between data and/or events, and thought by many to be ideal as a root language for artificial intelligence applications. Japan has singled the language out as a base for its fifth generation computer software.

Barwise is not at present directly concerned with Prolog or any other computer language, but is working on something much more fundamental: an attempt to develop a general theory of information and meaning, covering both natural and computer languages. The results could have great significance for future computer languages, machine translation of natural languages, computer speech recognition, and expert systems.

Although still at an early stage, the importance of Barwise's work is well recognised in the US, and last November he was given the \$21 million grant to expand his team, and co-ordinate US research on understanding the basis of meaning and information as

conveyed in computer and natural language.

This grant, from an independent US trust, is only to develop the fundamental theory according to Barwise and more money could follow to build practical applications.

Fundamental to Barwise's work is the belief that first-order logic is not enough to describe real life situations. First order logic is the use of simple logical connections like *and*, *or*, *not*, *implies*, all of which are wellknown to computer scientists.

**The problem with first order logic is that it attempts to isolate a sentence without taking account of who spoke it and where it was spoken**

According to the theory of first order logic, anything that cannot be defined using these is outside the domain of logic altogether.

First order logic is based on the mathematical theory of sets, which consist of objects classified by some simple relationship — sex differentiation for example. The language Prolog is built up around this idea, and is often called a first order logic language.

Given Barwise's criticism of first order logic, it is not unreasonable to assume that he might turn up his nose at Prolog. But not in front of Kowalski.

Instead he says: "I do have qualms about built-in semantics of

first order logic."

Barwise has qualms about the present application of logic to understanding how information and meaning are conveyed in natural language, and by implication he criticises present computer applications in speech recognition, natural language translation and expert systems.

"What we need is something that accounts for the whole picture," says Barwise.

The problem with first order logic, Barwise argues, is that it attempts to isolate a sentence without taking account of who spoke it and where it was spoken.

Sentences have to be related to the real world, before the full meaning can be extracted.

Some linguists distinguish between the meaning of individual sentences in isolation, and the information that can be inferred when the sentence is related to external factors such as whether the speaker of it is an inveterate liar.

But Barwise thinks meaning and information are closely related and cannot be considered as separate entities. Instead he refines meaning into two types: a universal meaning, and a meaning that is specific to the particular situation.

For example the statement: "It is two o'clock" has a universal meaning. It can either be two in the morning, or two in the afternoon. But if it is dark at the time, it can be inferred that it is two in the morning, unless you happen to be standing close to the North or South Pole. In this case, the statement would, according to Barwise, have the situation specific meaning that it is two in the

BARWISE... "I do have qualms about built-in semantics of first order logic."

morning.

This idea, when developed further, could be important for computer understanding of natural language. There would be two stages to the analysis: building up a picture of the universal meaning of the words, then relating this to existing knowledge of the situation to infer what was actually meant on this occasion.

Computers are light years away from being able to do this for general written or spoken languages, but there is no reason why they cannot do this in situations where the possibilities are limited, by a set of rules for example.

One example, taken from Barwise's paper *The Situation in Logic*, is the card game bridge. The game is for four players, in competing teams of two, and involves rounds of bidding to exchange information about cards in each hand.

One of the rules of the game is that each pair must tell its opponents the meaning of any unnatural bids. One such bid is "five clubs", which some people call when they have either four aces, or no aces, in their hand.

The partner of the person making this bid will usually be able to deduce the meaning of the bid from the cards held in his/her own hand, so the bid then has a meaning specific to the situation, according to Barwise's convention.

However the rules of the game only require the more general meaning to be explained to the opponents.

Such reasoning is by no means beyond the wit of computers, because the language involved, and the number of possibilities are limited. It is also easy to define the relationship between the utterance, or language used, and the situation, which is the card game of bridge.

Before computers can understand human speech, they must not only be able to extract meaning from sequences of individual words, but be able to identify the words themselves from the sound.

The same Barwisean principles could be applied to this process. Human speech, whether in Latin or Chinese, can be broken down into individual components, known to linguists as phonemes, which are independent of individual words. The problem for computers is that while each word can be regarded as being made up of several phonemes, in speech words run into each other, and therefore the phonemes can be distorted or lost altogether, making it hard to understand what is being said without additional knowledge of the situation.

At present, computer speech recognition systems work by matching spoken words with stored versions of the words. Mismatches are common, except where the vocabulary is limited to less than 100 words. And they can work only when trained to a single speaker — when the stored very

sions of the words are obtained by recording the person who is to use the system.

According to Barwise theory, trying to identify the words simply by pattern matching is a mistake because it is based just on first order logic, and ignores knowledge about the way words are combined in speech.

Individual words, like sentences, sometimes need to be related to the surrounding context for ambiguity to be resolved.

Returning to the problem of understanding the meaning of sen-

tences, Barwise explains: "Syntactic constraints between types of situations are what allow one situation to contain information about another situation."

He aims to develop a "situation theory", which he describes as an enrichment of mathematical theory. Already he has the axiom of this theory, which is: *Every real situation S determines a set of facts (S).*

More axioms will follow to enable the relationship between different situations to be related to the facts about them. It will remain to apply the theory to understanding of natural language.

This could also be applied to the compilation and interpretation of high level computer languages, or applications generators. Barwise plans to address the problem of inference, the process of extracting meaning from language.

This could be important for future development of expert systems. In the case of an expert system, inference is the process of making logical deductions about a particular case from an established base of knowledge in some expert field. The expert field might be medicine, the particular case the symptoms of pneumonia, and the knowledge base would be relationships between symptoms and diseases.

Maybe not all the symptoms are present in the particular case, but constraints between the sets of symptoms pertaining to each disease will often enable a diagnosis to be completed.

Barwise plans to study the more general relations between constraints that enable inferences to be made in language. He writes: "A genuine explanation of the commonsense notion of logic must examine these constraints in the context of all the other constraints that enable cognitive agents (people or computers) to pick up information from their environment and to serve as links in the informational chains, transmitting information from one to another."

"Turning this view into a genuine mathematical theory is an exciting but enormous challenge."

But this is what Barwise plans to do with support from leading US linguists, mathematicians and computer scientists.

*Situations and Attitudes* by Jon Barwise and John Perry, published by Massachusetts Institute of Technology Press, is reviewed on page 33.



BARWISE... "I do have qualms about built-in semantics of first order logic."



Trying to identify the words simply by pattern matching is a mistake because it is based just on first order logic



Meaning and information are closely related and cannot be considered as separate entities.

## PROJECT MANAGEMENT

In these articles, the bases of successful projects are examined

# Build foundations

SOME say the most important objective of a project manager is to get a salary increase and/or get promoted. The chances of obtaining either of these is enhanced if his project is successfully concluded on schedule and within allowed costs.

In order to do this, the project manager must be able to control what is happening on the project. Before he can exercise any control, however, he must have monitored the progress of the project against a plan. In other words, the plan is the yardstick against which progress can be measured, so enabling the manager to take any corrective or controlling action that is necessary.

Developing the plan therefore forms one of the most basic and important parts of the project manager's role. To use a building metaphor, it is the foundation upon which the success of the project is built.

Having seen the importance of the plan to the success of the project, it is important that it is not set

in concrete too soon, as it is also linked with the design process and may change as the project develops. These changes usually occur during the earlier phases of the project, particularly during the feasibility study phase.

In the feasibility study phase, many design alternatives may exist. For example a system may be implemented using specially written software, an applications package or, perish the thought, by manual procedures. For each of these alternatives there is a corresponding plan — at least in outline form. The costing and timescale of these plans are in turn factors in deciding which alternative to adopt.

Of course, once the basic design has been decided, any change of plan is viewed with a healthy degree of suspicion as the easiest way to complete a project on time is to change the schedule!

In order to build up a plan, one does, of course, need estimates of the resources likely to be required. The most important resource in a

computer project is usually development manpower, but other factors can also be critical — for example computing power available for development or implementation resources.

In the very early stages of a project — say, during the initial feasibility study — estimates are usually based on experience. Cynics may say that this is a polite way of saying the estimate is merely a guess based on gut feel.

However, so long as the experience on which it is based is relevant, this approach may be the only one that is practicable.

As knowledge of the project increases, so more detailed estimates will be developed. An important reason for estimating is to be able to monitor progress later, so the basis for estimating should be straightforward enough to allow this to be readily done. This means that the estimate must be based on some easily seen measure of progress — for example the number of lines of code written and tested. Once estimates of resources

needed — manpower, computing facilities and so on — are made, a plan can be produced. This plan, of course, has to cater for external constraints, such as current staff levels and cash flow.

There is a great temptation to accept the first plan that comes to light: this is a mistake. Remember, the plan is the foundation of the project and, within reason, time spent on this is rarely wasted.

As the project progresses, knowledge of the project increases and events occur (or do not occur when they should) which make it necessary to change the plan. Such changes should be questioned.

In this context, a useful safeguard is to keep a copy of the first plan readily available. When compared with the updated plan, this highlights creeping slippage.

A good project plan, realistically updated in the light of project experience and outside events, is the only yardstick a project manager can use to monitor progress. It is also the basis on which he will report progress to his boss.



The project manager must be able to control what is happening.

## Why best is the enemy of good

I FIRST came across the phrase, "the best is the enemy of the good", in a book on the design of real time systems. The author's point was that in a complex system, striving for the best design can take a very long time indeed — if the best design can ever be defined at all. In his view, it is better to take a design which is good and get on with the job of implementing it, rather than waste time chasing the elusive "best" design.

At first sight, "the best is the enemy of the good", can be seen as an excuse to stop trying and an answer to the lazy man's prayer. This is most definitely not the point.

The accent is very much on the word "good". It is up to the project manager to ensure that his

**This approach provides a golden opportunity for free lunches**

project is professionally completed on schedule. This implies both a timely and a good systems design.

While this phrase was originally applied to systems design, it also applies to a much wider field. For example, equipment selection is an area with scope for lengthy investigations of suppliers' wares in an effort to choose the best. By choosing a large enough number of suppliers to investigate, and bearing in mind the rate at which new products are developed in the computer industry, it is possible to evaluate and never to make a decision!

This approach also provides the evaluator with a golden opportunity for regular free lunches at various prospective suppliers' expense. The worldly project manager soon spots this strategy in his subordinate or boss. He then ensures that he has one or two good lunches himself and ruins the social scene by forcing a decision and getting on with the project.

The great majority of computing people are far more professional than this. Indeed the project manager's very professionalism can cause an over-zealous search for perfection, whether it is in system design or equipment selection. He needs to exercise leadership and channel this enthusiasm away from investigation for its own sake and into getting the project completed.

It has to be remembered that

searching for the best design or for the best hardware takes time. This not only costs money directly in terms of staff salaries, but also costs money indirectly in terms of delayed benefits or delayed savings from the completed project.

Sometimes the temptation to investigate for longer than is necessary is because this is easier and more pleasant than making decisions. Suppliers often think they discern this trait among their clients.

They also cynically note that a lengthy investigation is invariably followed by the expectation that delivery and implementation will be carried out in record time so that the completion date does not pass by. In practice this expectation is rarely achieved.

The important point in optimising design or selection is to keep in mind the relative costs and benefits of what is being done. For example, a procedure that is only used once a week is unlikely to need to be optimised as carefully as one that is used many times a day.

The well-known 80/20 rule usually applies. This says that 80% of the benefits are obtained for 20% of the effort; while the remaining 20% of the benefits require the remaining 80% of the effort.

Another example of misguided staff effort is in trying to minimise the amount of memory a system takes. This may have been very important 10 years ago when memory was relatively expensive. Now there is more likely to be an emphasis on response times, security and ease of maintenance rather than minimising memory usage.

As with all parts of a project, the design and selection processes must be planned and monitored. Because of the research aspect of much of this, it is very easy for this phase to grow and get out of hand. It is one of the most difficult tasks of the project manager to provide balanced control, so that this work is not skimped but is done well and within the time allowed.

In the phrase, "the best is the enemy of the good", the implication is that the search is for the technical best. I hope I have conveyed the impression that the project manager needs to have a broader view than this. For him the best system is not only produced on time and within the cost allowed.

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**Wembley Conference Centre, March 13-15 1984**  
**Open 09.30-17.00 daily**

In a fast changing market like computers you need to see the very latest hardware and software developments if you're going to be able to offer your customers the most up to date systems.

For keeping up with developments The Computer Trade Show is just the ticket — so to help you attend this exclusive trade only show we have printed the visitor registration form here. Simply fill it in and bring it with you to Wembley Conference Centre when The Computer Trade Show is on from March 13 to 15 and you will be admitted free.

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fide visitors return the form to Exhibition Manager and tickets will be forwarded to you immediately. Because the show is for the trade only you can expect a warm welcome from all the exhibitors who will be only too eager to discuss trade prices, distribution agreements, licensing agreements and so on. You can see many different suppliers all in one day, and have the kind of discussions which would normally require several formal appointments. You owe it to yourself and your clients to keep up to date so let The Computer Trade Show be your ticket to increased sales.



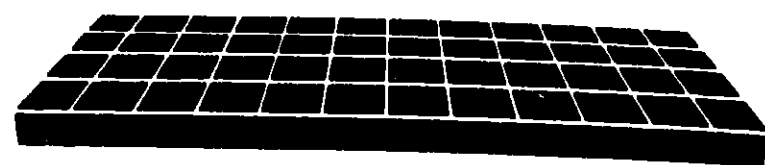


# An important conference for companies buying products to sell on to the user

The Computer Trade Conference is aimed at the serious computer trader. Manufacturers, suppliers and third party vendors will exchange ideas on the marketing and selling of computer products. Acknowledged specialists will present their ideas on the best ways to tackle third party sales.

Being held in conjunction with the Computer Trade Exhibition, the event is sponsored by Computer Weekly, Micro Business, Practical Computing, Systems International and Software.

## The Computer Trade Conference '84



Wembley Conference Centre  
March 13-14

### TUESDAY, MARCH 13TH RETAILING

- 8.30 COFFEE AND REGISTRATION
- 9.15 Mass Retailing of Business Micros — Michael Milman, managing director, Greens Business Systems (a subsidiary of Debenhams Ltd.)
- 9.55 How dealers should present themselves — Chuck Hansen, managing director, Computerland.
- 10.35 COFFEE
- 10.55 What Apple expects from their dealers; what Apple gives their dealers in return — Keith Hall, sales and marketing director, Apple Computers (UK).
- 11.55 Retailing through education and training — G. Summers, managing director, Planning Consultancy Ltd.
- 12.25 LUNCH

### MARKETING TO THE PROFESSIONAL AND CORPORATE MARKET

- 2.00 Choosing Your Products — Jack Schofield, editor, Practical Computing.
- 2.40 Market products and sales channels — key considerations in the building of the dealer programme — John Crawford, vice president, world wide dealer programmes, Data General Corporation.
- 3.20 Personal computer dealer marketing in 1984 — Nigel Hensell-Thomas, personal computer dealer manager, IBM Ltd.
- 3.45 DEC's approach to the marketplace — Mike Harding, marketing specialist, Digital Equipment.
- 4.10 How to approach the corporate customer — Hal Hovland, joint managing director, Hovland Business Systems.
- 4.50 CLOSE

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13 March.....  
14 March.....  
The fee of £185 plus £27.75 VAT for two days or £95 plus £14.25 VAT for one day covers attendance, coffee, lunch, conference documentation and exhibition admission. Tax invoice will be sent.

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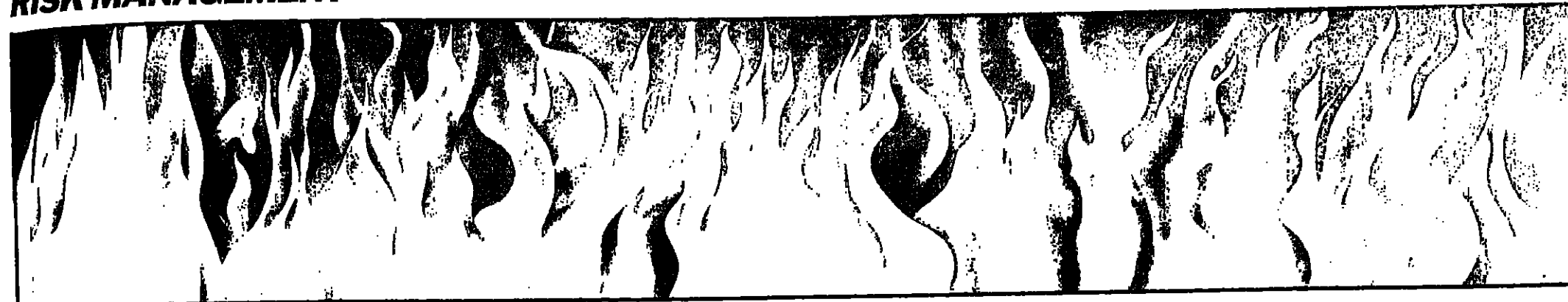
### WEDNESDAY, MARCH 14TH SOFTWARE

- 8.30 COFFEE AND REGISTRATION
- 9.15 Vertical market software — coverage of vertical markets by specific packages varies greatly — some sectors are over-supplied and there are many open opportunities — Russ Nathan, managing director, Romtec.
- 9.55 Procurement — How you evaluate software from various sources — David Turley, director information systems division, Tamsys.
- 10.05 COFFEE
- 10.55 Marketing Software — The Business Market — Barry Neil, sales manager, Micro Computer Products International Ltd.
- The Games Market — Nick Alexander, managing director, Virgin Games.
- 11.35 Systems and applications software developments — David Fraser, general manager, Microsoft Ltd.
- 12.15 LUNCH — Guest speaker — John McNulty, McNulty's Interchange.

### SYSTEMS INTEGRATORS AND OEMs

- 2.00 Communication is the key to office automation — Malcolm Reip, OEM marketing manager, Computer and Systems Engineering PLC.
- 2.40 Discs and Peripherals — Bob Britten, sales and operations manager, Kennedy International Inc.
- 3.20 Printer products and the markets — Alan Clemmetsen, consultant, Mannesmann Tally.
- 4.00 Market trends in VDUs and VDU terminals — Harvey Ulljohn, managing director, Lear Siegler Data Products Ltd.
- 4.40 CLOSE

## RISK MANAGEMENT



# Don't let the future of your business go up in flames

Firms can be ruined by disasters, such as fire or floods. David Cross looks at how to manage the threats and survive

MANY organisations that suffer total loss of their data processing functions cease trading as a direct result. Nevertheless, computer networks, especially in industries where there is a high volume of transactions, are an integral part of the business. Airlines, banks, insurance companies and building societies would find it almost impossible to function without data processing.

As reliance on computers increases, medium-size and even small firms are finding that their day-to-day business is becoming inseparably bound up with information technology. High levels of investment in computer equipment have meant increasing dependence — to the point where system failure can have disastrous effects.

In order to minimise the potential dangers, many businesses have adopted a "risk management" approach. Far from being a merely intellectual exercise, this technique has directly saved many companies.

It is a method of approaching the problem of how to deal with threats such as fire or flood, which can endanger a computer-based system. The objectives are to

maintained to avoid electrical short circuits.

Fires may also start where forms are kept in data-encoding or programming areas, which should be carefully supervised.

Smoke, heat and corrosive gases may enter through doors, windows, elevator shafts or air conditioning ducts. Tapes and disc packs may be seriously damaged in temperatures as low as 150 degrees Fahrenheit.

The first consideration to avoid these potential dangers must be the building in which the computer is housed. It should obviously conform to current fire safety standards and be separated from hazardous materials and operations.

Fire detectors should be used within the computer room to provide prompt, positive warning. The newest systems use detectors that are able to report the materials which are causing the fire. In adjacent areas, rate-of-temperature-rise detectors should be used, and, if possible, these should be installed throughout the building.

The control panel, which monitors these devices, should include enough indicators to make it easy to pinpoint the location of a fire. Ideally, the system should also be connected to the local fire station to ensure a rapid response.

By appointing a "fire team" small blazes can be controlled internally, but these should not be used as a substitute for the real fire brigade. At no time should they put their own lives at risk. Ample portable fire extinguishers should be provided and preferably an automatic extinguisher system.

Precautions must also be taken with regard to water. This can come in the form of natural flooding, broken pipes or water from fire-fighting equipment.

Another potential threat is deliberate destruction — sabotage, vandalism, arson or bombing. Extremists, vandals, extortionists, strikers, rioters and even angry customers or employees have been known to cause a great deal of damage. To counter this type of threat, the building, in terms of position, construction and methods of controlling access, must be considered carefully.

Everybody and everything entering the building should be checked, and visitors asked to use badges. Security guards or surveillance equipment are expensive but effective ways of watching your premises, although the equipment only works if it is properly manned and maintained.

Staff must be made aware of the need for watchfulness, and locks and badges should be periodically changed. Finally, personnel should be constantly screened and an ear kept to the ground for any signs of unrest.

In addition to these precautions it is essential to ensure that regular security copies are taken, and that at least one copy is kept off the premises. Then, in the event of a

disaster, these copies can be used on an alternative computer.

Imagine a company that has made a substantial investment in computer equipment. Being prudent, it appoints a risk manager; trains its staff to be fully aware of potential threats; and takes every conceivable precaution to guard its computer equipment. Having done all of this, it still has to deal

with Murphy's Law: if something can go wrong, it will.

To counter this most unpredictable of threats, the organisation must have adequate contingency plans. These plans should provide insurance for the present monetary value of the equipment, so that it can be replaced if lost.

The second, and even more vital, part of the contingency plans

is to have immediate access to an alternative data processing capability. This is usually referred to as a "disaster recovery" service.

One of the leading companies offering such a service for Digital Equipment users, is Allen Computer International (ACI). It is a London-based DEC OEM, which offers bureau, personal computer and word processing facilities.

At ACI's data centre, operations can be recommenced rapidly with a minimum of disruption when someone's site ceases to function normally.

Its "disaster plan" for Vax and PDP-11 computers has two levels of service. The first level allows a company to use a suitable configuration on a timesharing basis. Staff can either continue to work from their own offices by using the data centre's communications network, or they can use ACI's premises in central London.

The second option provides a suitable computer configuration to run the software that is required. Emergency utilisation of this resource is available on a "sole users" basis. Once again, staff may use the facilities at the London data centre, or gain access to the system via remote communications.

The emergency recovery service is available to subscribers 24 hours a day, seven days a week. Experienced operations staff are always on site, ready to provide assistance on an "escalation" basis, depending on the severity of the problem which has occurred.

The details of a company's current configuration are checked

Everybody and everything entering the building should be checked, and visitors asked to use badges... Personnel should be constantly screened

when it joins the service, as well as the applications software and current operating system. This is to ensure full compatibility and to eliminate any difficulties should a disaster occur.

As part of the service regular dry-runs are undertaken, where discs and tapes from the user site are run at ACI's bureau.

Naturally, security is of the utmost importance to a service like this, and ACI only allows fully authorised personnel into the computer section of the data centre. Even to gain access to the reception area requires the use of a controlled entry system.

As businesses, public utilities, government departments, charities, hospitals and services increasingly rely on computers, safeguards must be put into operation. To ignore this requirement is not merely to risk the cost of the equipment, but to put in peril the continued existence of the organisation itself.

The safest course of action involves the appointment of a risk manager; sufficient insurance to cover the replacement value of your computer equipment; and guaranteed access to a disaster recovery facility.

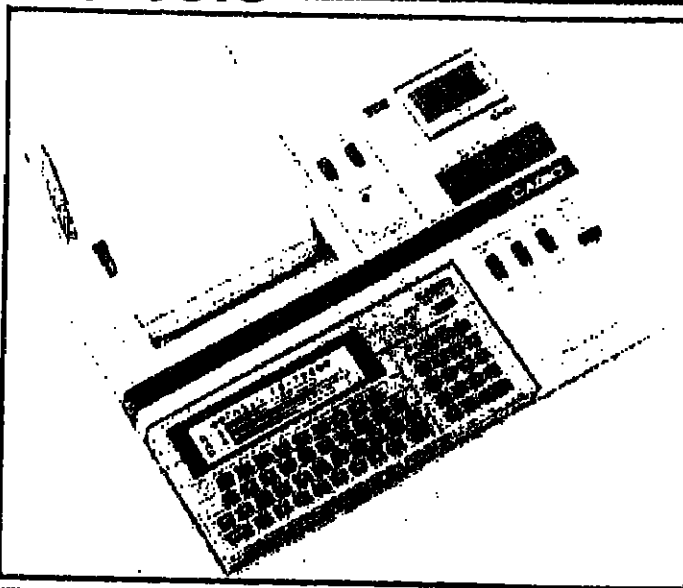
David Cross is a freelance journalist.











The Casio PB700 personal computer in FA10 cradle.

## Pocket-size personal

THE start of a progressive push into the personal computer market is marked by Casio's launch of model PB700.

Using four penlight torch batteries for up to 100 hours of continuous use, PB700 measures 7 1/2 x 3 1/2 x 1 1/2 inches and weighs 1.1 ounces, yet it has 4K RAM, expandable to 16K RAM in 4K steps.

A qwerty layout keyboard and a 4 line x 20 character LCD display are included in this small package. The display can also show 160x32 dot graphics.

Using an extended Basic, the keyboard can be used to enter upper and lower case characters, Basic keywords, symbols, and numbers on the separate numeric keypad.

The PB700 is supplied with an

instruction book, quick reference guide and carrycase.

Casio is also introducing the FA10 cradle. This is A4 size and has a four-colour plotter/printer using 1/2 in plain paper, an external cassette port with remote on/off and a section to take the optional CM1 microcassette deck.

FA10 is supplied with a carrycase, two rolls of paper, four colour pens, external cassette leads and an instruction book. The complete package weighs under 5lb.

Recommended retail prices are: PB700 (4K) £139; FA10 printer/plotter £189; OR4 (4K RAM) £29.95; CM1 microcassette £65. All prices include VAT.

Casio Electronics Co (CW), Unit 51x, 1000 North Circular Road, London NW2 7JD. Tel: 01-450 9131.

## Micro designed with builders in mind . . . . .

BUILDING contractors are the target for a new micro system from Wilcox Computers. The Wilcox 2000 is a switchable 8- or 16-bit micro with three software packages designed for estimating, costing and sub-contracting applications.

The company has only a 2% market share in this industry from its earlier systems, but company chairman Robert Shove says an independent survey of the market by PA Consultants indicates that the System 2000 "has a bright future ahead."

The building industry has just come through a severe recession, says director Dennis Wrigley. "As a result the margin for error in estimating is extremely small and the need for a computer system which can keep track of estimates and stocks is obvious."

The main problem with selling computers into this industry is ignorance on the part of company

managers, says Wrigley.

The micro is a departure from those previously offered by the company in that it uses "industry standard" components, including Z80A and 8088 processors and the CP/M operating system, in place of in-house developments.

Internal management of the system is handled by an eight-bit 6502 CPU which also controls the 15 in screen display.

Internal storage is 512 kbytes. The software is written in CIS Cobol though Shove says the system will support any high level language.

The entry level price for the system is about £5,000.

Production at the Wrexham factory is ten machines a month - all destined for clients in the building industry.

Wilcox Computers Ltd (CW) Rackery Lane, Llay, Wrexham, Clwyd LL12 0PL. Tel: (0978-83) 4866.



Bull Peripherals' portable test unit.

## Portable test unit

NOW available from Bull Peripherals UK is a lightweight portable test unit which has been designed to test the entire range of 10 1/2 in and 5 1/4 in disc drives (5-120 megabytes) manufactured by Bull Peripherals in Belfort. Featuring a ST 506 industry standard interface, the PTU can also be used to test other manufacturers

disk drives using the same interface.

The test unit allows the user to set his own test parameters by linking together a series of resistor programs.

Bull Peripherals UK (CW) Kingswick House, Sunninghill, Berkshire SL5 7BL. Tel: 0634 23491.

## PRODUCTS

### Speed-up for the Apples

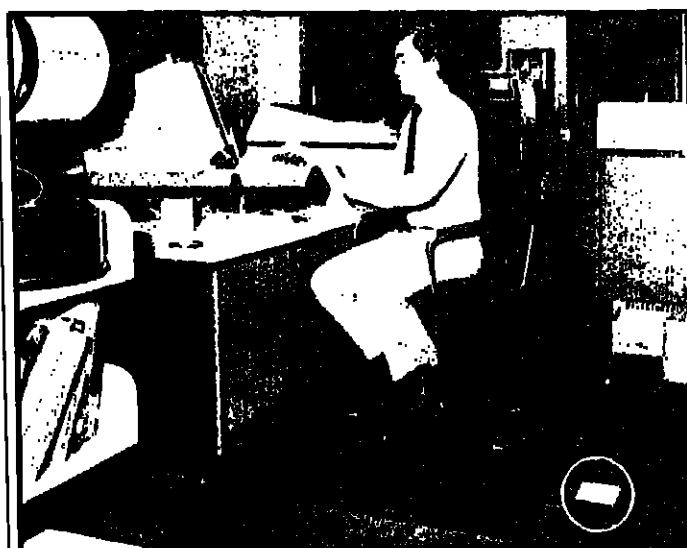
FIRST product from the newly-formed Digital Research hardware division is CP/M Gold Card, an add-on for the Apple II, II+ and IIe series of personal computers which is said to allow CP/M applications to run on these machines up to three times faster than with competitive cards.

CP/M Gold Card is a printed circuit board that plugs into any internal connector slot in any Apple II.

CP/M Gold Card uses a six-megahertz Z80 microprocessor with 64 Kbytes of on-board memory and an optional cache memory of 128 Kbytes. In addition, optional cache memory can enhance performance in many applications without the user having to make any changes in the program.

The CP/M Gold Card will sell in two configurations: £399 for basic capabilities and £640 with the 128 Kbytes cache memory feature.

Digital Research (CW), Oxford House, Oxford Street, Newbury, Berkshire RG13 1JB.



Clean Tread's anti-static mat.

## Anti-static protection

CLEAN Tread Service is supplying anti-static mats to protect mainframes and microcomputers against damage caused by static electricity.

Charges of between 3,000 and 5,000 volts will build up merely as the result of a person walking across a carpeted room or when an operator moves position on a chair and may introduce errors into

programs and in some cases burn out silicon chips.

The new mats are positively earthed to a standard wall socket which rules out the possibility of any static contamination and they can withstand repeated washings without any deterioration in anti-static properties.

Clean Tread Service (CW), Furnage Street, London SW18 4DF. Tel: 01-874 4333.

## Sales system with insurance brokers in mind

A MICROCOMPUTER designed for insurance brokers is announced by Kalamazoo.

With the Kalamazoo system, the broker's staff will have prompt access to all renewals and related data. In addition, staff are released from time-consuming manual routines, and are able to concentrate on prospecting, selling, and writing new business, says the manufacturer.

The system is based on the recently-introduced K2150 hard-disc multiprocessor microcomputer, designed, manufactured, sold and supported exclusively by Kalamazoo. For use with the K2150, a software package for brokers has been produced by a team of specialists in Kalamazoo's R&D department.

The software package makes entries on receipt of cash, prepares and reconciles banking, keeping running totals of the broker's ac-

counts, aids reconciliation with the insurers, and maintains a range of management statistics which include control of debtors, instalments, and overdue accounts.

To these can be added client accounting and statement production for credit policy holders, and monthly settlement statements for larger cash clients. The system automatically produces pre-renewal lists and renewal invitations.

Operating the Kalamazoo system is simple: a conversational routine displayed on the VDU screen is used. If, for example, the operator is using the wrong insurance company for a particular type of business, a message on the screen will indicate this.

The cost of the system is £5,275 depending on configuration; the basic software package, £1,975.

Kalamazoo (CW), Northfield, Birmingham B31 2RW. Tel: 021-475 2191, ext 560 or 435.

## Cromemco personal upgrade

CROMEMCO has developed a full-size professional keyboard for the C10 personal computer and is to make available a range of industry standard software packages.

These packages include Wordstar, MailMerge, InfoStar and CalcStar.

In addition to the standard qwerty key set, the new professional keyboard features a 14-key numeric pad for fast data entry, and 20 function keys to speed frequently-used keyboard operations. No alterations are needed to use the new keyboard.

New third-party software packages have been tailored to run on this Z80-based machine.

The C10 has extensive in-built communications facilities allowing several units to be interconnected and used as distributed workstations in a networked environment, or to function as intelligent terminals (front-end processors in large installations).

Cromemco (CW), 30 Dundas Street, Edinburgh EH3 6JN.

# Screen star.



The TeleVideo 924.

In a family of great performers the TeleVideo 924 is truly a screen star. Bringing the power and versatility you would expect from the world's leading independent manufacturer of video display terminals.

Engineered to both fit and survive, this non-flare high-contrast CRT combines beauty with brains. Packed with features which include 16 non-volatile programmable function keys, 64 special graphics characters, 32 non-embedded visual attributes, combinations, programmable delimiters, buffered printer, and a reprogrammable keyboard.

Not is the 924 a one-night wonder. It will go on performing with dynamic reliability for years to come. It's setting new standards.

So, if you would like to see the TeleVideo 924 perform (or would like more detailed information), make a reservation with the able and experienced staff at Mellordata.

# Supporting cast.

As a supporting cast we will not be as well known to you as the star performer on the left:

In bettering the service that you can offer your customers though, we are just as essential.

Because a professional back-up service can mean the difference between you giving a customer the service he wants or giving him problems he can do without.

We'll give you, for example, a firm and competitive price.

We'll give you a definite delivery date (as a promise, not a guess) and we'll provide all the advice you need to make the most of every machine you sell.

From a printer to a touch sensitive screen and beyond.

And we guarantee our concern won't stop with the delivery van.

Mellordata's Field Engineering Group has been on the road for ten years keeping computers computing.

It all adds up to a service which has been greeted by warm applause wherever we have performed.

As with any performance though, it's always best to be your own judge.

Authorised distributors for TeleVideo and Mannesmann Teletype  
Exclusive distributor for Datamedia and Carroll Touch  
Technology. Authorised main dealer for Epson.



NEW TECHNOLOGY IN EXPERIENCED HANDS

Mellordata Limited, Woodhouse Road, Eastleigh, Hampshire, England. Telephone: (0235) 249101. Telex: 980764 MELLORD G.

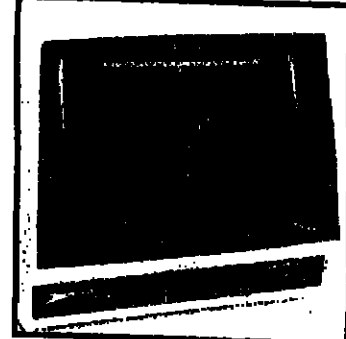
## Monitor offers sharp graphics

ZENITH Data Systems has launched a colour monitor, the ZVM-133, which can display an infinite array of colours and intensities with sharp graphics, according to the manufacturer.

A high resolution colour graphics monitor, it is designed for use with Zenith's own range of desktop computers, the Z100 series. It is also compatible with most business microcomputers having RGB direct drive outputs, such as the IBM Personal and Apple III.

The ZVM-133 has a 25 line by 80 characters display and pixel resolution of 640 dots by 480 lines (interlaced), which creates impressive graphics. It has a wide bandwidth of 20 MHz with the rise time of 70 nanoseconds to generate crisp lines, pure colours and intensely clear copy.

Front-access user controls enable convenient operator adjustments. An LED indicator notifies



The Zenith colour monitor.

the user when the monitor is operable.

A "green screen only" feature incorporated in this colour monitor eliminates all other colours. This enables monochromatic material to be displayed on the black face of the screen.

DC-coupling permits the video display to retain its colour balance from a single dot to full screen data.

The ZVM-133 monitor is priced at £395 plus VAT, and quantity discount packages are available.

Zenith Data Systems (CW), Bristol Road, Gloucester, GL2 6BB. Tel: (0452) 29451.

## Page faxed in 30 secs

INFOTEC has launched a new version of its 6400 facsimile transceiver with a V24 interface which allows the transmission of data between external modems on leased lines as well as the national telephone network.

Called the 6400 VM, the new model allows documents to be used on existing data transceiver lines. It will also operate with a suitable time division multiplexer as part of a multi-terminal network sharing a single line.

Fully compatible with the latest Group III facsimile machines, the desk-top 6400 VM can transmit a standard A4 page in 30 seconds. It uses thermal printing techniques to give a high contrast reproduction.

The 6400 VM is approved by British Telecom.

Infotec (CW), Hoechst House, Salisbury Road, Hounslow, Middx TW4 6JH. Tel: 01-572 2761.

## More power for Pyramid

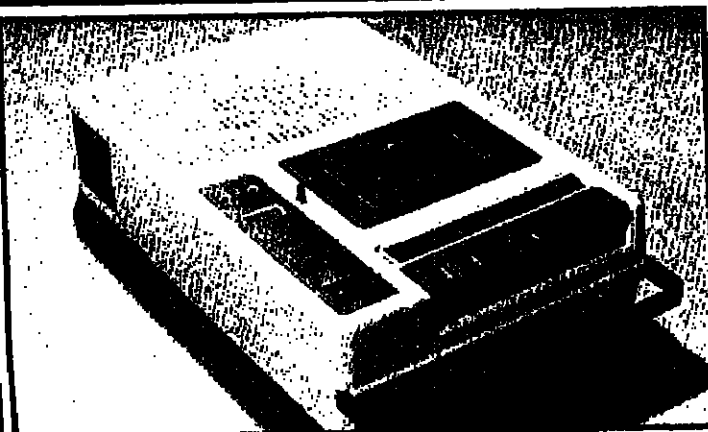
DELTA Data Systems has extended the power of its Pyramid terminal system with the launch of a new microprocessor unit, with integral Winchester disc drive and 16-bit capability.

Like all the hardware in the Pyramid range, the two versions of the new microprocessor, the Pyramid 504 (16-bit) and 505 (Winchester) are UK designed and manufactured.

A Pyramid user can start with the existing 501 processor, with twin floppy disc drives and, by in-place enhancements, move on to a 16-bit processor or Winchester disc, or both. Such enhancement possibilities make the Pyramid a much more powerful and versatile system, says Delta.

The Pyramid 504 is available now and the 505 from April.

Delta Data Systems (CW), Swallowfields, Welwyn Garden City, Herts AL7 1JD. Tel: Welwyn Garden City 33833.



Audio and data recorder from Bell &amp; Howell.

## Heavy-duty recorder

A HEAVY-DUTY cassette recorder for the BBC, Acorn and other personal computers has been developed jointly by Bell & Howell and Leasinglink Viewdata. It is being marketed through the two companies' retailers as the Bell & Howell 11/LVL 3179CX.

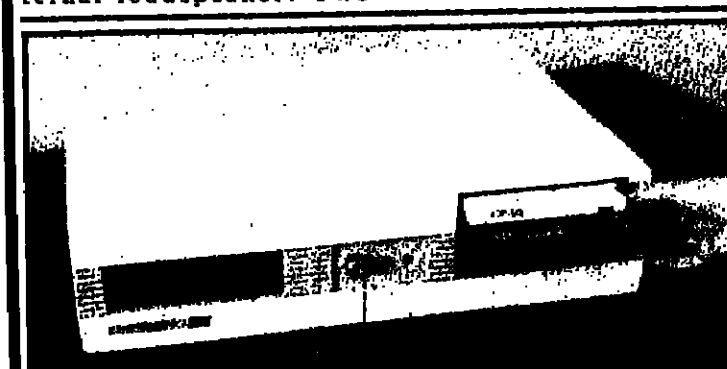
The recorder is based on a system designed for use in schools. The educational pedigree of the design is evident in the operating keys with their function symbols in relief so that blind users can identify them by touch.

The 3179CX has an internal microphone as well as an external loudspeaker. Two

headphone sockets are provided for private study as well as a socket for remote control of the drive motor by the computer, an external switch or an optional switch on the external microphone.

The recorder follows educational practice in having "cue and review" modes. These allow fast forward or backward winding to be done with the "play" key depressed so that playback begins immediately.

Bell & Howell (CW), Alporton House, Bridgewater Road, Wembley, Middlesex HA0 1EG. Tel: 01-902 8812.



The C3005 from Country Computers.

## Launching into networks

COUNTRY Computers, a Redditch-based manufacturer, enters the network market with the launch of the C30005.

The central system server can communicate via CP/Net with up to 15 users, all with their own Z80A processor with 64K RAM.

Unlike many other multi-user systems, data transfer is handled at full processor speed over the system's bus, improving system throughput and minimising the

bottleneck found in some systems.

Because all five processors have been designed on a single PCB for

maximum reliability, a letterbox technique allows users to communicate directly with each other without the intervention of the system server, permitting instant transfer of electronic mail.

Optional system software has been enhanced to include multi-key ISAM with powerful print spooling features.

The system is priced at under

£5,000.

Country Computers (CW), Pipers Road, Park Farm Industrial Estate, Redditch, Worcs: B98 0HU. Tel: (0527) 29826.



## PRODUCTS

## Memorex enters the integrated office

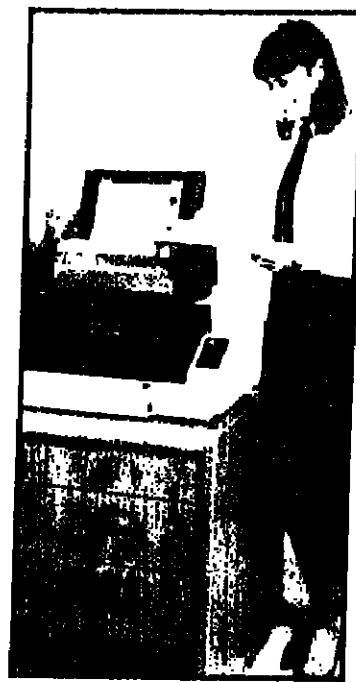
DESIGNED for both data processing and word processing applications, the 2068 is the first of a series of announcements which Memorex believes will put it in the forefront of the integrated office.

The 2068 offers matrix printing at 350 characters per second and quality text at 80cps. It will attach to IBM as well as to Memorex controllers.

A major feature of the 2068 is that character, style and shape can be changed in flight giving bold headings and italic script for added impact.

The printer also offers condensed and proportional printing and a full range of paper handling options, all selectable either automatically from the CPU or through the operator control panel.

The 2068 is priced at £3,905. Demonstration machines are already available with volume deliveries scheduled for April.



The 2068 from Memorex.

The new printer joins Memorex' 2000 Series of 3270 compatible displays, controllers and printers.

The 2068 printer is the first of a series of major products to be announced in the next few months by Memorex.

Memorex UK (CW), Memorex House, Church Street, Staines, Middlesex. Tel: Staines 51488.

## Electronic publishing on the Perq

PROLOG Software Limited has launched a text processing software package called QED which has been developed for users of ICL's Perq raster graphics workstation. QED is used in conjunction with the LBP-10 laser printer from Sinrom Electronics.

Developed by Oxford University's Program Research Group, QED produces documentation which requires more than conventional word processing can achieve, but for which full-scale typesetting would be inappropriate, says Sinrom.

Examples include the production of technical manuals, sales guides, staff handbooks, research reports and newsletters.

QED is fully compatible with Prolog Software's 2-D drafting system Perq DP, and meets all the common composing requirements including a variety of type fonts,

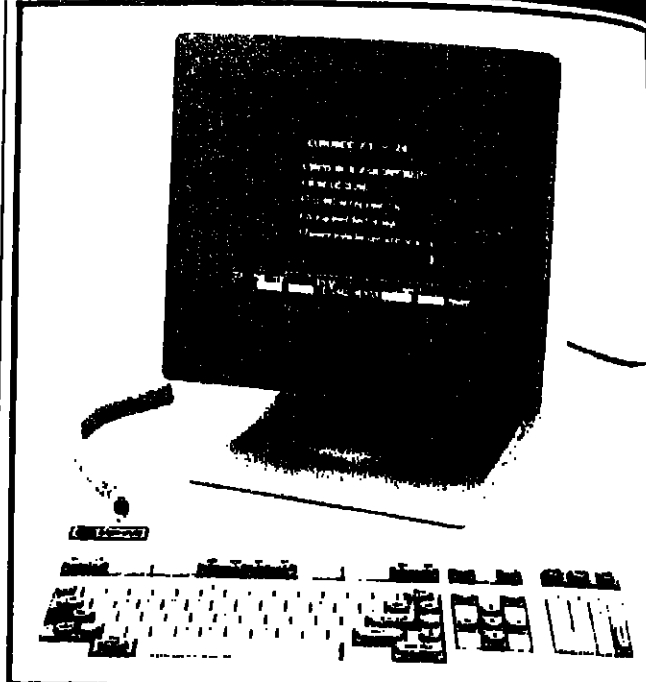
text justification to left or right margins, cut, fill and paste options and true proportional spacing.

Additionally graphics such as pictures, diagrams and charts can be placed alongside or included within bodies of text, and the user can see each complete page on the Perq workstation screen and make amendments before final printing.

Final copy is produced on a high resolution Sinrom LBP-10 Laser printer.

To maintain good resolution, QED maintains two font files for each character set, one at Perq resolution to display text on the screen, the other at 240 pixels per inch for use on the Sinrom printer. This gives better print quality than doubling up on pixels when using an increased resolution print device.

Sinrom Electronics (CW) 14 Arkwright Road, Reading, Berks, RG2 0LS. Tel: (0734) 875464.



The Beehive FT20 Ansi-compatible terminal.

## Eurobee family grows

BEEHIVE International (UK) announces that its second Eurobee terminal, the FT-20, is now in production at the company's factory in the Irish Republic.

The new terminal, designed with users of DEC equipment in mind, follows the launch earlier this year of Beehive's FT-10 and forms part of the family of three smart ergonomic VDUs produced for the European market.

The terminal configuration manager feature developed by Beehive allows many functions to be initiated, direct from the keyboard without resorting to complicated switching. An Ansi-standard editing terminal is a choice of either 80 and 132 column format.

Based on the Intel 8084A-2

10MHz microprocessor, the FT-20 is designed for more specialist OEM applications or, for the end users, can serve as a viewpoint into a database environment. Typical applications for this buffered VT100 compatible terminal are message communications equipment, retrieval, transaction processing, distributed data processing and process control.

Beehive's 52,000 sq. ft. factory in Co. Cork and the Ascot marketing company were set up 18 months ago to handle European trading. The US parent in Salt Lake City has been established since 1969.

Beehive Ireland (CW), Beehive Road, Fermoy, Co. Cork, Ireland. Tel: (025) 31777.

## NEC joins dot matrix market

NEC has entered the dot-matrix printer market with the Pinwriters family, available from Thame Systems.

There are currently two models in the range. The P2 is an 80-column device, while the P3 is a full-width 136 character machine; otherwise all features are common to both models.

The Pinwriters are multi-mode printers. There is a draft speed of 180 cps, a high density mode of 90 cps, and a near letter quality mode of 30 cps. All three modes are either hardware or software switchable, as is the ability to switch font styles in the midst of printing text.

Standard fonts are Pica, Elite and Condensed print, with the provision for downloadable fonts also being standard.

The long life print heads (200 million impressions per pin) are of 18 wire staggered configuration for maximum dot density and long life. This is borne out by MTBF figures of 4,000 hours and a thereafter average repair time of 20 minutes.

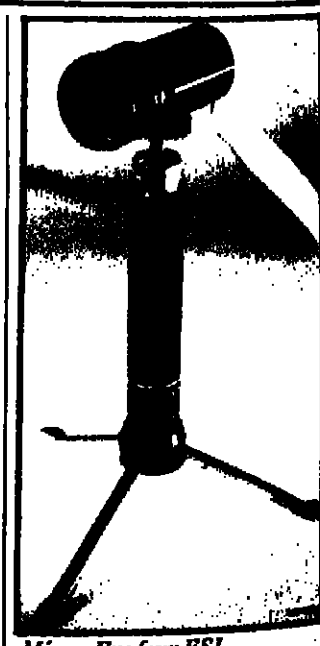
Thame Systems (CW), Thame Park Road, Thame, Oxon OX9 3XD. Tel: 084 421 5471.

## Micro fault locator

A MICRO system fault locator has been launched by GP Industrial Electronics. Called the MFL 373, it is designed for fast fault-finding and de-bugging prototype micro-based hardware.

Operation is based on simulation, which allows all the lines of a system bus to be independently driven and sensed. The microprocessor of the system under test is replaced by the appropriately matched test pod of the MFL 373.

GP Industrial Electronics (CW), Unit 2, Haxley Close, Newnham Industrial Estate, Plymouth. Tel: (0752) 832961.



Micon Eye from BSI.

## Computers get the eye

COMPUTERS can be given an eye, with the new Micon Eye, a solid state image sensing unit using Micon Technology's OpticRAM.

The package includes camera, lens, tripod, 6ft telephone cord (camera to computer), floppy disc with camera software routines, instruction manual and serial TTL interface for Apple II, IBM-PC, Radio Shack TRS-80 CC, Sinclair Timex or Commodore 64.

Most popular baud rates are provided by the Micon Eye interface. Options include spare IS32 OpticRAM 25ft telephone cord, IS32 Bullet with 4ft interconnecting cable, zoom or macro lens and RS232 interface.

The camera has 128 x 256 element resolution capable of transmitting up to 20 frames per second. Software is delivered on a floppy disc with self-promoting command modes allowing continuous scan, freeze frame, frame store or compare frame to frame.

ESI Components (CW), Brighton Hill Parade, Brighton Hill, Basingstoke, Hants. RG24 8BP. Tel: (0256) 57166.

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Terry Booth, General Manager  
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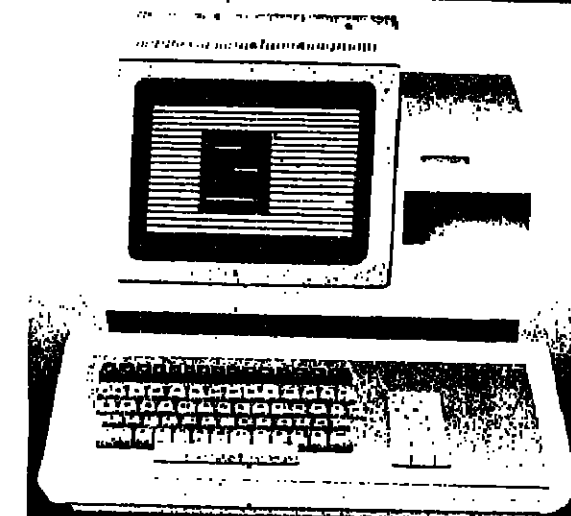
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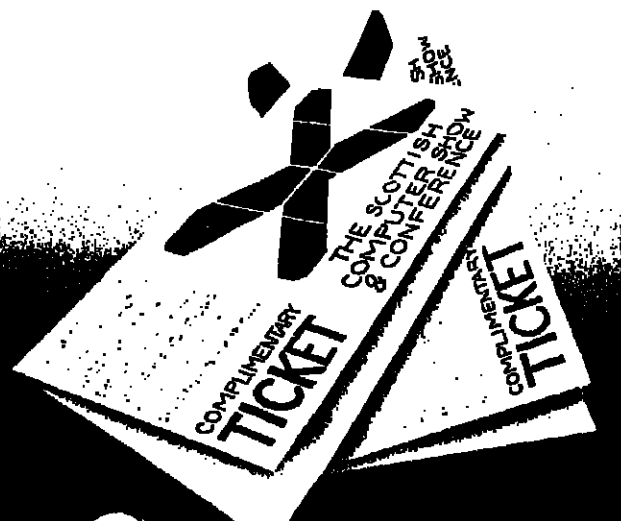
If you're looking for your first computer or seeking to upgrade your present system, it's common sense to visit the Scottish Computer Show. Because it gives you the perfect opportunity to choose the right mini, micro, word processor, software or peripherals.

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## CIRCULATION

Computer Weekly has a circulation of 128,325 independent audit 10th November, 1983. Price Waterhouse, Average circulation for the period 15 December, 1983 is 120,139 - the largest ever VNU audited figure achieved by a computer journal.

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Martin Burgess (Ref: B541), Personnel & Training Department, British Aerospace PLC., Dynamics Group, P.O. Box 19, Six Hills Way, Stevenage, Herts. SG1 2DA

Tel: Stevenage (0438) 312422 Ext. 2040 (Out of office hours Stevenage 312378).

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Applications currently operating in the group include a bespoke order entry and sales ledger system running at a number

of regional sites on IBM system 34 computers. New projects recently introduced include a manufacturing system running at one of our factories and the installation of a group financial accounting and management reporting system with a number of remote user sites. For this latter purpose the company has just taken delivery of an IBM system 38 computer at head office.



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- \* System Analysis and Design.
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The profile that we seek therefore calls for at least four years experience in software design and development, preferably including the

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### THE DP ENVIRONMENT

Currently an IBM 4341 model 2 running MVS, CICS, DL/1 and COBOL, with a 3083 model E due to be installed in March. In addition, Hoechst is committed to personal computing, with 19 Apples in use under the guidance of an Information Centre.

### THE VACANCIES

Two project leaders are required initially, with further expansion planned. They must be experienced systems analysts, preferably - but not essentially - with an IBM background and a good understanding of TP and database concepts and practice. Similarly, the successful applicants need not be former programmers, but they must be able to lead a programming team. The principal qualities needed are powers of leadership, self-motivation, and the ability to take a project from feasibility to implementation.

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### SYSTEM SUPPORT PROGRAMMER

A system programmer is required to join our busy technical services section.

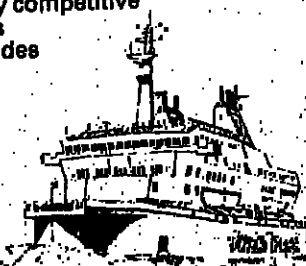
Four years' sound experience is required at least one of which must have been spent in a VME support role. Experience of one or more of the following would be an advantage: COBOL, PASCAL or DME. The right candidate must be able to demonstrate the ability to work on their own initiative.

### ANALYSTS

Experience of VME/DME transition will be of particular interest, as will practical experience of on-line systems, database, mini and micro systems. Candidates with limited analysis experience having a solid programming background, will also be considered.

These positions offer excellent opportunities, highly competitive salaries and benefits package which includes concessionary travel and a pension scheme.

Please apply with full c.v. to  
Derek Weaver  
Senior Personnel Officer  
Townsend Thoresen  
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Kent  
CT17 9TJ



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# Analysts with mini experience A management opportunity.

Croydon Area £14K package

Our client is a leader in their sector of the Advertising Industry, employing 500 people at 5 locations and with a group turnover of £18million pa. They have recently installed a PRIME 550 and are in the process of converting existing systems from both Bureaux and an in-house IBM System 34.

These predominantly bespoke systems are written in RPG II and are being converted with the aid of ESCAPE 34. Applications include:

- Sales Order Processing
- Management Information Systems
- Payroll
- Nominal, Purchase & Rent Ledgers
- Fixed Asset Registers

## DP Manager

They now require a DP Manager to take over the management of a department of 5 people, have budget responsibility and report directly to the Finance Director.

In particular, the DPM will need to review existing systems and, in the light of additional requirements and new facilities available on the PRIME, produce a 3 year plan. The objectives being to:

- ensure the best use of existing facilities.
- introduce potential enhancements (system generators & 4th GL).
- co-ordinate activities with external systems at associated companies.
- increase the use of microcomputers, for possible Distributed Processing.

You'll need to have at least 2-3 years good system design experience on minicomputers (ideally PRIME), an understanding of relevant commercial applications, be able to interpret user requirements and specify solutions to them. Since this is a dynamic environment which will involve you in negotiating with and supervising external software houses and programming staff, it is essential that you communicate well both orally and in writing.

Consideration will be given to relocation assistance where appropriate. To take your first step up into management, telephone Hugo Fair on 01-828 6846 or send your CV to: NSH Associates, 205 Victoria Street, London SW1E 5NE.

# NSH



**Sales Support with AARQUE**

**...tomorrow's Drawing Office technology - today.**

**c. £11K**

Aarque Systems Limited are a leading supplier of equipment and materials to drawing offices and print rooms with products ranging from the most sophisticated reprographic systems to drafting materials. They are both manufacturers and distributors in the U.K. with a head office at Colnbrook, two regional depots, 13 branch offices and 13 print shops, employing a total of 800 people.

Computer Aided Design and Drafting (CADD) has been available in the U.K. for many years but has traditionally been reliant upon large and expensive computers which has meant that the majority of drawing offices still rely on manual methods of drafting. With the recent dramatic growth in the sophistication of micro-computers, practical CADD systems are becoming available at a fraction of the previous cost bringing these systems within the affordable reach of even the smallest drawing office.

Aarque are forming a new division which will market a complete range of low cost micro-computer based CADD systems. Initially, Aarque CAD centres will be in London and Derby and plans are well advanced for other locations.

**London & Derby**

Their sales philosophy is to provide 'hands on' demonstration facilities for potential clients at local showrooms where there will be a number of different systems on display.

The Sales Support Engineer will give demonstrations and liaise closely with potential customers regarding their specific requirements. Experience of design/drawing office practices and a knowledge of micro-computers is therefore highly desirable.

Major company benefits will also complete the attractive package - including BUPA; Pension Scheme; Company Car, etc.

For more details of these exciting opportunities please contact: Jim Wallis.

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office night: 01-748 1967/1975/2460  
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CADsearch, London House,  
271-273 King Street, London W6 9LZ.

# CADsearch

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## LOOK NO FURTHER! SYSTEMS 38 ANALYST/ PROGRAMMER WITH RPG3 EXPERIENCE

- Salary negotiable circa £11,000 p.a.
- Prestigious Company
- Small, established team
- Attractive Thames Valley location

If you have a minimum of 12 months' previous experience on the IBM 3800 or equivalent system, and the ability to design and implement programs in RPG3, then we would like to hear from you.

So please the Personnel Department via Window 2224 for an application form and details.

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Chesborough Pond Ltd.

## Managers

Varied career, balanced personality, assertive and ambitious. Probably 30 to 35, you will have that quality which engenders confidence in your seniors and wins respect from your peers.

## Euro. S/W Supp. Manager

**Herts. c£20K + car**  
Experience in a customer support environment is essential for this position. Candidates must be capable of technical appraisal of reported software difficulties, prioritising their status and allocating appropriate resources. The job will require diplomacy and resilience in dealing with senior managers across several national boundaries. A European language other than English would be a major asset. Major company benefits.

## O.S. Software Manager

**Herts. to £16,000**  
A chance for a junior manager to build a new career. It is essential for candidates to have previous experience in design and development of operating system software. He/She will be responsible for a small team which will introduce UNIX to an existing product line whilst continuing to be responsible for current O.S. software revisions. Previous UNIX ideal but not essential.

## Mgr. Systems Installations

**Berks. £15.5K + car**  
Our client, a world leader in micro-based environmental control systems requires a technical manager to control further development of existing software and manage the installation of complex systems on client sites. The successful candidate will have several years experience in a mixed software/hardware environment, project management, staff selection and will be responsible for all new software applications taken on by the company.

## Office Auto Prod. Manager

**Hants. £18K-£20K + car**  
This senior position will require a broad background and knowledge of the office automation market and applications. Candidates will need to be capable of developing business plans, of evaluating products and managing support staff. We will be looking for substantial experience of W.P., text management, electronic mail and ideally, experience of the personal computing market.

## Project/ Team Leaders

You will already have made significant achievements at project level. You are well organized with strong interpersonal skills and a proven ability to lead a team.

## Proj. Leader L.A.N.'s

**Herts. c£15,000**  
The ideal candidate for this position will combine a strong background in development methodology with skills in personal communication to work closely with marketing people in the U.K. and U.S.A. He/She will be responsible for a team of 5 to 10 people developing network system products. We would prefer to hear from people with a computer science degree and Pascal/Algol programming skills.

## Team Leader

**Beds. £12.5K to £16.5K**  
Our client, an independent subsidiary of a large successful engineering group, has designed and developed an extremely successful product in the E.P.O.S. market. In the last 18 months turnover has doubled and additional people are required at all levels. The team leader will be responsible for new developments covering planning, quality and budget. Assembler and high level language background. T19900 and RTL2 ideal.

## Diagnostic Proj. Leader

**Herts. c£14,500**  
If your background includes experience as an engineer and low level programming, you may be the person to lead this vitally important area for our client. With support costs figuring highly during product life the importance of effective software diagnostic aids is becoming increasingly important in maximizing profitability. We would like to hear from candidates who believe they can contribute in this area.

## Proj. Manager Banking

**Herts. c£16K + car**  
Ideally candidates will have previous experience in banking applications or very closely related. They will have the temperament for client liaison and be technically competent in the area of transaction processing systems and communications. Our client is a highly successful U.K. subsidiary of an American company which has established itself in the rapidly growing area of Electronic Funds Transfer systems.

## Designers Specialists Consultants

Your specialist skills have been developed over several years. You command respect for your personal ability and enjoy being recognized for individual contributions.

## Support Consultants

**Herts. to £17K + car**  
These are high level support positions working in close liaison with company's sales force. Candidates will be capable of providing assistance with technical expertise and general business advice to support the sales force and prospect base. Work will involve demonstrations, presentations and customer assistance during the pre-installation period. Experience with sophisticated micro/minil business systems essential.

## Comms. in Banking

**London to £18,000**  
This is a particularly attractive part of the computer industry combining, as it does, the areas of international high finance and constantly improving computer communications systems. Our client has a lengthy background in this area using DEC equipment and now requires additional development and support staff. Good commercial experience in banking or finance is the major requirement.

## Software Lecturers

**Bucks. to £13K + car**  
We are seeking experienced professional lecturers to join an established and extremely well equipped training centre which functions as an integral part of our client's support organization. It is essential to have T.P. applications experience with in-depth knowledge of data analysis. Data comms. and DBMS knowledge would be a welcome bonus. Excellent career prospects.

## S/W Tech. Authors

**Herts/Hants/Beds to £12,000**  
Previous experience as a technical author/writer is essential. Your background will probably include a period of some other aspect of computing either as a programmer or engineer. You must be capable of working with software people and providing the written descriptions of their products which make them useable by their intended customers. Your skills are widely sought by many of our clients.

## Software/ Electronics Engineers

The life blood of the industry. Maintained project leaders and contributors of the future. Develop your education. Enthusiasm and keen to prove yourselves.

## Micros/Minis S/W Progs.

**Berks/Herts. £8K-£13K**  
A specialist product company which has developed PDP 11 and Z80 based systems for the travel and communication sector and a scientific instruments manufacturer which uses PDP 11's for real-time control are both seeking programmers to join development teams. We will be looking for mixed experience from the following: Z80 assembler, Macro-11, Fortran, C, PL/Z, CP/M, RSX-11 and UNIX.

## Comms. S/W Design

**Herts/Beds. to £14,000**  
Develop your career and your communications software skills by joining a company whose existing range of comms. software is second to none. There are a number of teams working on various developments covering LAN's, X25 and 3270 compatible products. Development is on mini and micro systems in assembler and high level languages. Reloc. assistance where appropriate.

## Energy Control Sys.

**W. Country £9K-£14K**  
A major international company with diverse interests in many technical markets has a well established subsidiary which supplies computer controlled energy management systems worldwide. We would like to hear from programmers who have real-time experience preferably with assembler and a high level language. Usual equipment is PDP-11 with Intel 8085 and purpose built consoles etc. Variety and scope for the future.

## UNIX Support Specialist

**to £12,500 + bonus + car allowance**  
Our client offers you the opportunity to put your knowledge of UNIX software to special use in providing technical support to their sales force. The company is a major international computer manufacturer and offers significant long term career prospects. Your role will be to advise and assist customers with their applications to help qualify prospects and prepare technical proposals/presentations.

**Open letter to  
experienced computing staff  
seeking new opportunities**

Write or telephone (02403) 28383 during office hours.  
We are always ready to discuss these and many other interesting positions.

Evenings and weekends only:  
Terry Harvey - Great Missenden (02406) 4705  
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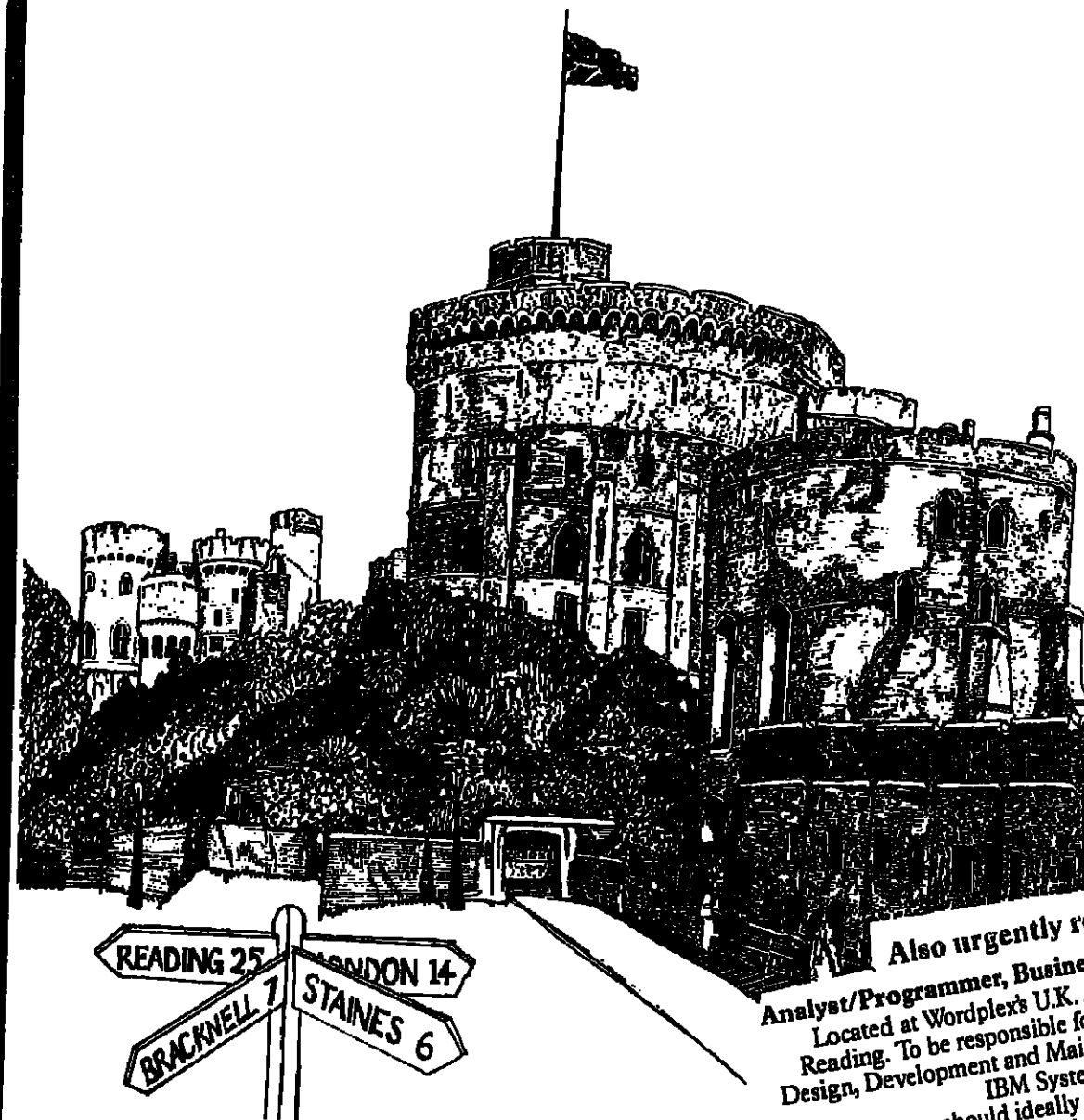
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# HR

# HR





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## WORDPLEX

Systems Division

### Software Specialists/ Programmers

£ negotiable, plus car.

Wordplex are a leading WP/Office Automation company with products ranging from Personal Computers to large distributed office systems.

We currently require Software Specialists and Programmers for active involvement in the development/enhancement of the following:

- |  |  |
|--|--|
| <input type="checkbox"/> Operating Systems | <input type="checkbox"/> Word Processing     |
| <input type="checkbox"/> Communications    | <input type="checkbox"/> Computers           |
| <input type="checkbox"/> Electronic Mail   | <input type="checkbox"/> Local Area Networks |
| <input type="checkbox"/> Electronic Filing | <input type="checkbox"/> Wide Area Networks  |

If you have a sound assembler background, or experience of a block structured language (e.g. Pascal), and feel you could make a useful contribution in one or more of the above areas, we would like to talk to you.

Also urgently required!

**Analyst/Programmer, Business Systems £10K neg.**  
Located at Wordplex's U.K. Management H.Q. in Reading. To be responsible for all aspects of System Design, Development and Maintenance on our in-house IBM System 34.

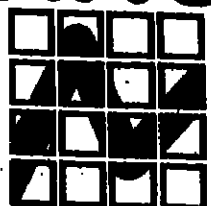
Applicants should ideally have two years' RGP 2 experience and a thorough knowledge of maapics. Full training will be available on datapoint and wordplex equipment.

Please write with curriculum vitae or telephone George Shaw on 01-549 9236 (24 hour answering service) for an application form.

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Reporting to Management Services Manager, the company is looking for an intelligent individual to undertake studies and projects concerning the whole range of business decision making. This is an opportunity to apply an enquiring and analytical mind to a complex area. The ability to communicate clearly both orally and on paper at all levels is essential. 4 years O and M experience is required in an engineering environment.

### Analyst Programmer to £11.5K

Candidates should have a minimum of 2 years' experience of Basic + under RSTS/E preferably with a knowledge of production systems. Duties include system generation for production control system in France and order processing system in U.K., maintenance, package installation and training junior staff. Reports to Systems Manager.

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To apply please telephone George Shaw on 01-549 9236, (24 hour answering service).

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Our client's aim in creating the position is to bring together the Operational Support and Systems Programming Departments under the management of the new appointee, in order to provide a more co-ordinated approach to Operating Systems Management, Resource Management and Future Capacity Planning.

Naturally, the position requires a high degree of management ability and experience, ideally gained in a technical or systems programming environment, although this is not essential. Exposure to the latest IBM mainframe software would also be a distinct advantage.

This is a key position within this rapidly expanding and profitable company and the conditions of service and salary will reflect the importance the group places upon the appointment. These include a mortgage subsidy, free BUPA, free life insurance and an interest free season ticket loan.

For further information apply, in confidence, to our London office quoting reference A1/O103/CW

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I am interested in the position: **MS03CW**

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## TP Specialist Europe

For Amdahl, what comes next is probably the most exciting phase since our company was formed. Its sales approach the billion dollar mark we are set to expand our TP products to provide a new dimension in communications technology.

Correspondingly we are seeking TP Specialists to spearhead the vital tasks of customer support, internal consultancy and new product introduction.

For you the question could be how to stay at the edge of communications development, expand your horizons into Europe or maximise your earnings. Amdahl can offer all three so, whatever you do next, check our requirements.

If you qualify, you could become part of a team recognised for providing the best support in the industry.

### TP SPECIALIST

Have you reached the stage where you consider yourself a TP Specialist? Someone with the expertise to diagnose and resolve network problems? Can you provide technical assistance and guidance to colleagues - and management? Are you ready to take these skills into a new and challenging environment?

If so here is an opportunity not to be missed.

The European TP Specialist will be responsible for supporting customers utilising Amdahl's advanced 4705, a superbly designed communications processor which forms the foundation for a fully integrated network.

You should have sound hardware experience of 370, 3705 or equivalent, modems and 3270 products and be familiar with PTTs and 360 channel protocol. A good understanding of SNA, VTAM and NCP is essential, perhaps preceded by experience of MVS as a systems programmer or from practical debugging.

Mature and professional, you should have the ability to convey your ideas and concepts effectively, both to colleagues and customers.

These positions are based in West London, at the Amdahl European Support Centre. Regular travel to Europe and occasionally the Middle East and South Africa will be required.

To apply, contact our consultant, Francesca Drinkwater or write for an application form using the coupon below.

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(7842)

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This includes an ICL 4Mb 2956 running under DME/VME, an ME 29 running under TME, plus a network of over 140 DRS terminals providing RJE and interactive services throughout the Borough.

Join us at Camden and you can expect involvement in a far wider range of applications than you'd find in any single commercial establishment - applications concerned with financial control and accounting, housing management, personnel, buildings and works, and all the varied social services.

## SYSTEMS & PROGRAMMING SPECIALISTS

By the way, did you see the jobs featured in our advertisement on 16th February?

**DEVELOPMENT MANAGER**  
£15,225 - £17,544 (Ref: C7/WB)

Responsible to the Head of Computer Services for leading and co-ordinating the work of project teams developing a comprehensive range of systems. Must have at least 12 years' experience - including management of systems development in a large organisation - and be capable of contributing to the long term expansion of the Unit.

**SENIOR SYSTEMS ANALYST**  
£11,730 - £13,929 (Ref: C8/WB)  
**SYSTEMS ANALYSTS**  
£10,251 - £11,730 (Ref: C9/WB)

To lead or participate in small teams working on the development and implementation of specialist projects. Senior positions call for at least 5 years' experience, of which two should have been on a large system. Analysts should have at least three years' experience, including some programming.

**LEADING PROGRAMMER**  
£11,730 - £13,929 (Ref: C10/WB)  
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£9,345 - £10,851 (Ref: C11/WB)

To lead and supervise programming staff within a given development area and take responsibility for technical aspects of their work. Must have at least 5 years' experience (including supervision of programmers) and a sound knowledge of COBOL and SCL under VME/B.

To assist with the development of specialist applications. Must have at least 2 years

COBOL experience. A knowledge of SCL under VME/B would be an advantage.

If you're flexible in your attitudes and willing to get involved, we can promise you extremely rewarding career prospects and the chance to enhance your personal and professional skills through challenging and demanding projects, plus a comprehensive training programme.

We're centrally placed, close to Kings Cross and Euston Stations, with a pleasant working environment. In addition to salaries in the ranges indicated, which include London Weighting, our benefits include generous holidays, pension scheme, interest-free season ticket loans, subsidised restaurant and assistance with relocation expenses where appropriate.

For immediate action and a detailed information package, write quoting the appropriate reference number to: Departmental Staffing Officer, Room 207, Town Hall, Euston Road, London NW1 2RY, or telephone our 24-hour Ansafone on 01-837 9988, quoting the appropriate reference number. Closing date for completed applications: 19th March 1984.

Camden is an equal opportunity employer. Applicants are considered on the basis of their suitability for the post regardless of sex, racial origin, marital status, disablement or age. All posts are open for job-sharing.



**CAMDEN**  
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*Computing with the human touch.*

## Systems Analyst

**Business Technology**

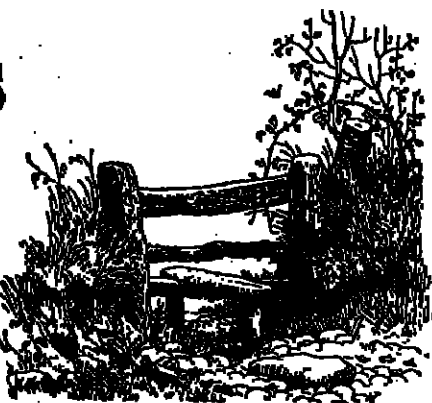
**Circa £10,000 + Relocation**

### The Client

Is a highly successful and profitable company operating in the forefront of technology. Located in an attractive part of Cheshire, it is well served with motorway, road and rail links.

### The Position

Is within a small Business Technology section working in the field of office systems encompassing such areas as information storage and retrieval, text processing, personal computing and the associated equipment and software.



### Cheshire

### The Candidate

Ideally will be a graduate with at least two years systems analysis experience. It would be particularly beneficial for candidates to have had specific experience of one or more of the areas outlined above. Good communication skills and the ability to operate independently or as part of a project team are essential personal characteristics.

For further details please ring Tony Roberts on 0270 827206 during the day or 0270 824088 evenings and weekends. Or write to him at the address below.

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You will be working in a small Data Administration group that supports development project teams, providing expertise on Data Analysis and Database Design and subsequently performance monitoring and tuning. The main database software is IMS/DB with CICS under MVS.

Probably in your mid 20's you will have had 2/3 years experience in either a database support group or in programming with DL/1 based applications. Salary is negotiable according to experience and will be accompanied by a generous benefits package which includes Non Contributory Pension, Group BUPA scheme, subsidised restaurant, and after a qualifying period season ticket, loan and mortgage facilities.

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Familiar with logic programming?  
Want to join a company committed to a new generation of software?

Then contact us with full C.V.  
We are a rapidly growing company and one of the first to market expert systems products. Our Development Section is located on a Science Park next to a pleasant modern University campus. The Yorkshire Dates are within easy commuting distance. For the Consultant posts, you should have first hand experience in logic programming with Prolog, plus several years more conventional experience in data base management in either commercial or scientific applications. You should also be capable of leading a project team.  
Salary in the range up to £12K (Knowledge Engineers) or up to £18K (Consultants) dependent on qualifications and experience.



Reply to: Cathy Jones, Company Secretary,  
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Knowledge Engineers/Expert Systems/Management Consultants/  
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## Computer Exploration Services Ltd

### Technical Author/Programmer

Computer Exploration Services is a member of the Petroconsultants Group - the largest organisation gathering and disseminating information on worldwide energy exploration and production, with a strong emphasis on computer mapping.

We are seeking a Group Technical Author whose primary functions will be:  
Preparation of User Documentation for all Group Software  
Production of brochures and sales material  
Development of user-interface standards

Secondary functions will include:  
User training and support (internal and external)  
Presentation of Group Services to the Petroleum Industry  
Program maintenance

The position is Cambridge-based with occasional travel to Dublin and Geneva.

**ESSENTIAL** prerequisites for this position are:  
3 years FORTRAN in a scientific environment, using computer graphics  
2 additional years as technical author

SALARY is negotiable.

Please submit applications, enclosing full c.v., to:

**COMPUTER EXPLORATION SERVICES LTD**  
Burleigh House  
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Cambridge CB5 8EG  
Or contact Gerard Hurrell on Cambridge (0223) 318833 (0077)

## BUSINESS ANALYST SYSTEMS ANALYST PROGRAMMER

A large subsidiary company of a leading international engineering group is creating an in-house Systems Department to support a major investment in technology.

Main computer systems, real-time and batch are processed remotely on IBM equipment. On site mini and micro-computers will be used increasingly.

Current and future areas of systems development covering the whole range of the Company's activities, include COPICS manufacturing systems, CAD/CAM, Office automation and Financial products.

The Company is, therefore, seeking experienced and enthusiastic staff to play a significant role in a small, highly skilled team being assembled at this location.

Candidates for the three positions must be able to demonstrate a proven track record ideally gained in an IBM on-line environment developing commercial applications. MVS, CICS/IMS, TSO/SPF, PL/I experience is preferred.

These positions offer competitive salaries, contributory pension scheme, etc.

Please apply in writing, stating age, experience and salary, to:

Personnel Department, B.R.D. Company Limited, P.O. Box 2, Aldridge, Walsall, WBS 8DT (0078)

## LECTURERS

**SALARIES NEGOTIABLE**

KBS Training is a major provider of training courses to both Government and industry, having been established since 1958.

We will shortly have permanent vacancies for the following lecturing staff:

**Systems Analyst** London based  
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**Programmer (RPG/II)** Liverpool based

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Although previous lecturing experience would be an advantage, this is secondary to the possession of solid experience, self-confidence and enthusiasm.

The company offers an excellent benefits package, including pension scheme, BUPA, generous holidays and twice-yearly salary review.

Please telephone Mrs J. Jones in our Liverpool office (051-258 2000) for an Application Form. (0010)

## BOX NUMBERS

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Quadrant House, The Quadrant  
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# SMR

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## MIDLANDS & NORTH SOUTHERN ENGLAND

Candidates are likely to be currently employed in selling CAD/CAM systems for a recognised major supplier or involved in the provision of engineering related computer services, preferably with an engineering qualification. Sales targets are relatively low for this sector of the market place and anticipated on target earnings will be

**£32,000 + COMPANY CAR**

Please contact Alasdair Scott (London), or Roger Dodd (Lichfield), quoting reference SSA/024.

This job is available to both men and women.

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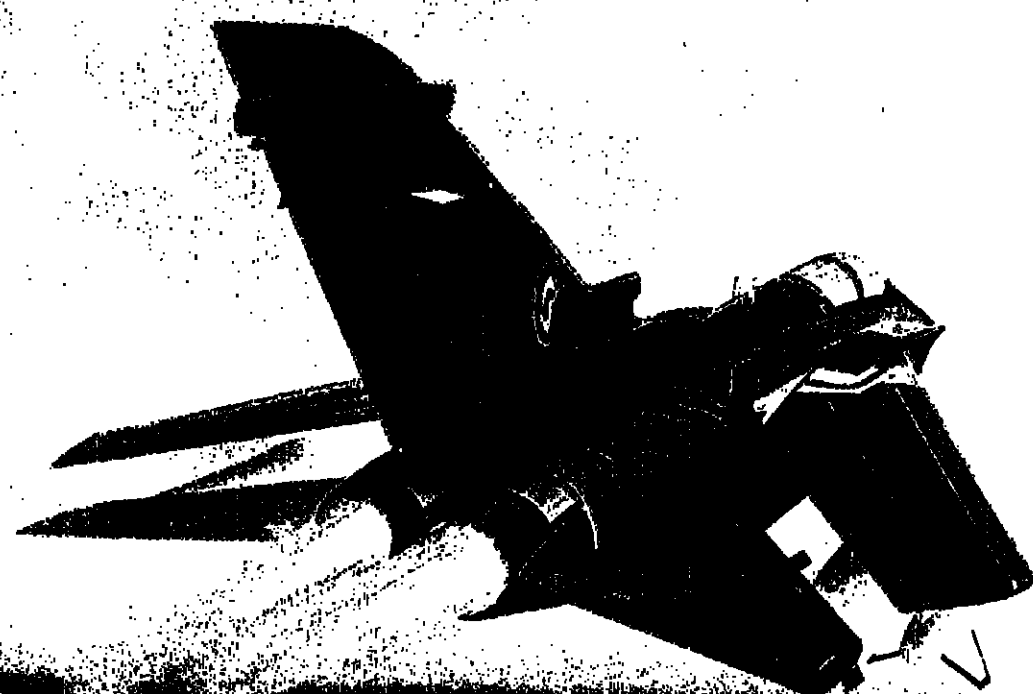
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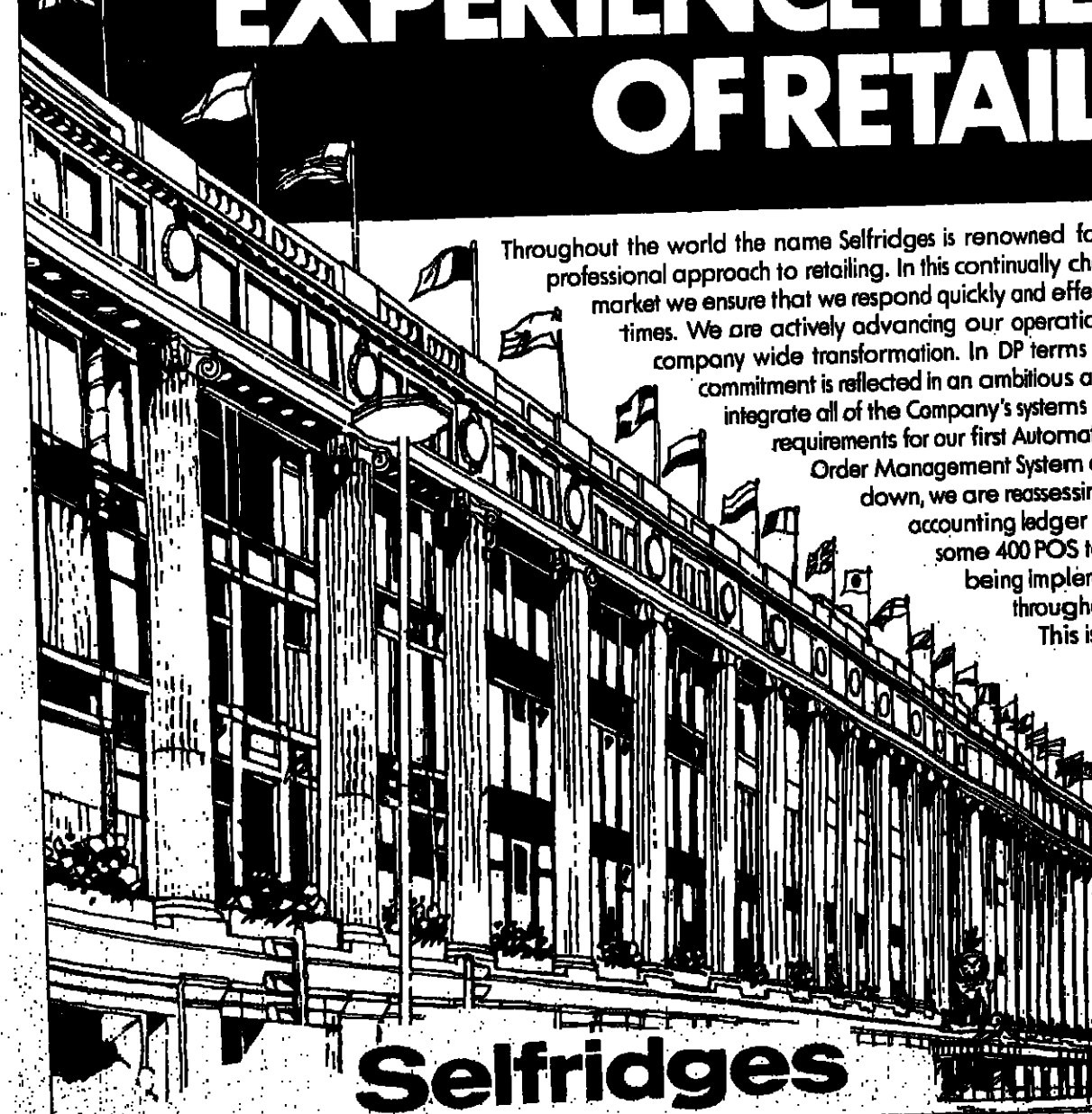
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The Systems Consultant will advise and support clients in the design, development and use of hardware and software for new computer-based applications. Current projects range from networked PC's to image processing systems, and cover a variety of applications including medical systems and air traffic control. Applicants must have wide experience - including the design of computer systems - and involvement with one major project throughout its life cycle. Ideally, applicants will have held a senior position for five years, and have a proven record for managing both hardware and software activities. A good lecturing/teaching style would be an advantage.

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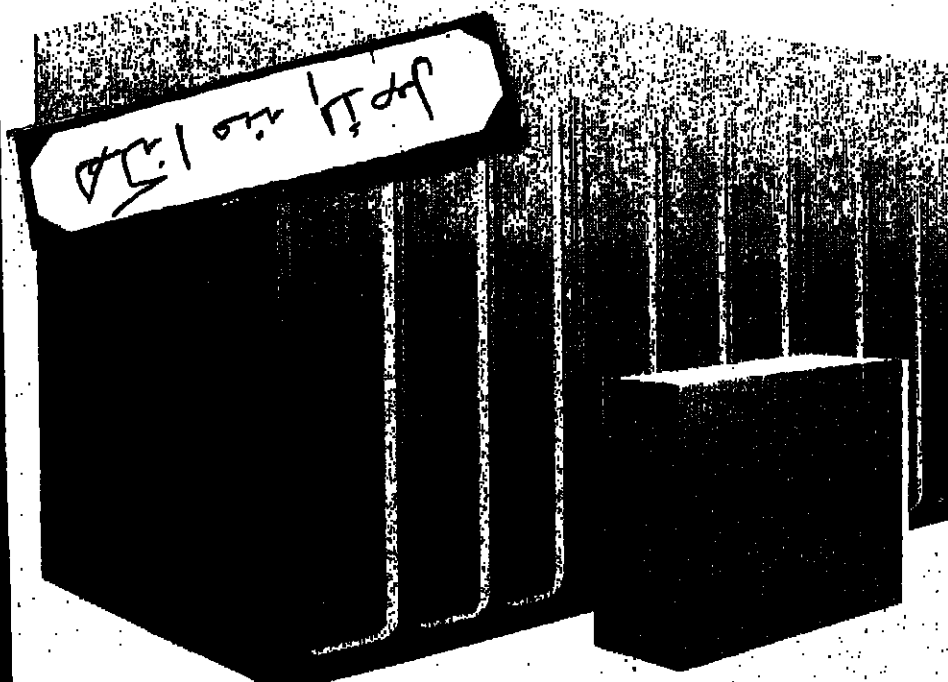
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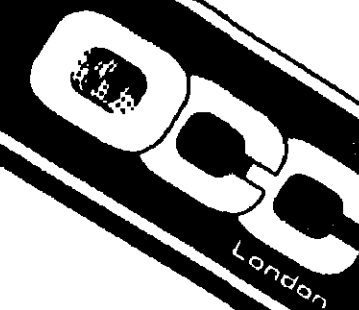
The working environment is excellent. Laboratories are fully equipped with some of the latest and most powerful computer tools. Most mainstream manufacturers' products are featured in a fully integrated installation centred on ICL 19045/2966 accessed via intelligent terminals. Experience in any block structured language would be appropriate.

The company is based in one of the UK's lowest cost of living areas, yet educational, recreational and leisure facilities are excellent, and the area is surrounded by some of Britain's most beautiful, natural, countryside.

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## Senior Analyst Programmer

c £12,000

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The immediate aim is to install a new IBM System 38 in our headquarters in ESSEX, and then provide a networked link, using the latest IBM software, to our sites throughout the U.K.

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We think the ideal candidate should have considerable IBM GSD experience preferably to include S38 and RPG III and have a desire to work in a networked environment. He or she will be heavily involved in the initial systems and programming design. Subsequent phases of the project will provide the opportunity for travel between user sites. Successful candidates can expect a competitive salary and the benefits associated with a major employer.

For further information and an immediate interview contact our advising consultant SIMON KONING at

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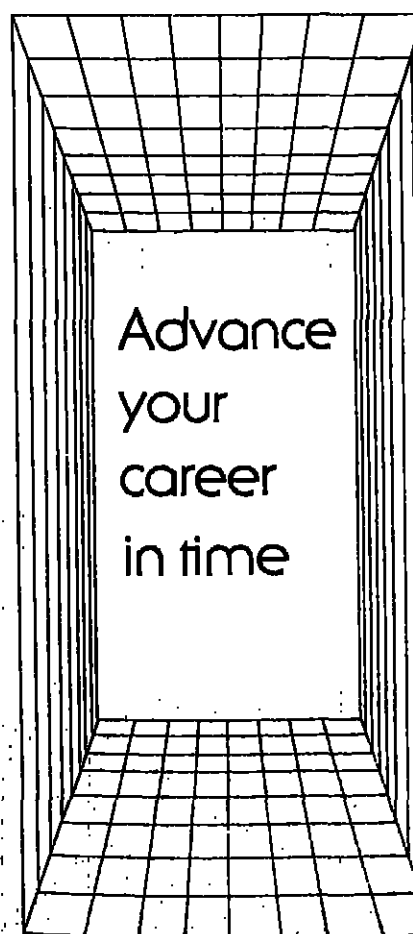
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## SYSTEMS & SOFTWARE ENGINEERS



**Marconi Underwater Systems**

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Involving the detailed planning of trials necessary to support the weapon development programs and the subsequent analysis of weapon behaviour.

### Mathematical Modelling

Experienced engineers are required to derive mathematical models of complex weapon systems and their environment and to design and develop both digital and real time simulations of these systems.

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### Algorithm Development

Comprising the design of the algorithms which determine the 'cleverness' of the software controlled weapons, using techniques such as pattern recognition and artificial intelligence.

### Real Time Software

Engineers are required at all levels with experience in one or more of the following to develop software on DEC or GEC Computers to control weapons or real time simulators:-

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Tel: 01-908 4094 during office hours.

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### Data Analysis Software Engineers

To develop FORTRAN software on VAX 11/780 computers to provide user friendly facilities for the analysis of simulation and trials data. Data storage facilities include a RELATIONAL database and the hardware used includes COLOUR GRAPHIC displays and hard copy PLOTTERS.

Your time and our time are important. If you are not able to contact us immediately but would like to know more about this young company with its informal friendly management style we have put together a taped message which will explain exactly why we are at the forefront of our industry. Telephone 100 for Freefone Neptune and the message.

Or better still, telephone or write to Trevor Groves today. On the other hand you may prefer to see us at our informal interview and company presentation evening at The Post House Hotel, Swindon, March 7. It's up to you to take these real opportunities and influence events, where achievement is rewarded with career progression.





## Assistant Telecommunications Engineer

V.S.E.L. a subsidiary of British Shipbuilders, is a major organisation with over 12,000 employees in Barrow-In-Furness on the edge of the Lake District National Park. Due to expansion a vacancy exists in our Telecommunications Department for a recently qualified graduate with a degree in a Telecommunications related discipline. The department is responsible for the provision and operation of an efficient cost effective Telecommunications service, based on an IBM 3750 SPC switch, at the main site in Barrow-In-Furness and a Voice and Data network, feeding various locations throughout the country. The successful candidate would participate in the design and development of an integrated network for voice, data, telex and facsimile. The successful candidate would be involved in the evaluation and selection of equipment from various sources and would be expected to supervise some field installation work.

Salary would be commensurate with age and qualifications.

For an application form, male or female applicants should write to the Assistant Personnel Manager, Vickers Shipbuilding and Engineering Limited, P.O. Box 8, Barrow-In-Furness, Cumbria, LA14 1AB.

(8120)

## CONTRACT

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ANALYST PROGRAMMERS  
TANDEM COBOL ANALYST PROGRAMMERS/PROGS (8120)

HEXAGON

## SUPPORT ENGINEER

TANDON INTERNATIONAL, the leading manufacturer of small disk drives, require a SUPPORT ENGINEER to work from their Reading facility.

Applicants should have practical experience with both floppy and Winchester drives including in-depth knowledge of digital magnetic recording principles. SALARY c £11,000 pa. Other benefits include company car, BUPA, holiday bonus.

PLEASE CONTACT Sharon Renew  
**Tandon** Reading (0734) 864678

## URGENT CONTRACTS Long Term MVS SYSTEMS PROGS

Contact Dave Peart  
STRAID COMPUTER SYSTEMS LIMITED  
Sundial House  
99 High Street, Guildford  
Surrey, GU1 3DP  
Tel: Guildford (0483) 34444/5 (16/20/2)

## SYSTEMS DEVELOPMENT MANAGER IBM 34 SITE

Circa £11,000 plus Bonus

We are seeking an experienced analyst programmer with an IBM 34 background to head our computer department in developing our systems into a first-class information service. The introduction of a System 38 is currently under consideration. The ability to liaise with user departments is of vital importance and a knowledge of MAAICS would be desirable.

Applications with full c.v. to The Personnel Manager, F. Francis & Sons Ltd., 50-62 Blackheath Road, London SE10 8DH. Tel: 01-692 7191.

(7991)

## Team Leader Computer Support South Africa

Gold Fields of South Africa Limited is a mining and finance house incorporated in the Republic of South Africa, with its Head Office in Johannesburg, and is listed on the Johannesburg, London, Paris and Zurich stock exchanges. Its policy is to invest in the mining and processing of metals and minerals in Southern Africa and to explore for and develop new projects in the energy, precious metal and base metal fields.

Gold Fields operates a centralised computing facility, based at Head Office, which serves all Group companies and utilises an ICL 2977 mainframe, supplemented by a network of equipment including graphics work stations for on-line engineering applications.

The Computing Facilities section now requires an experienced software specialist to head up its technical support team. The team leader will be responsible for the forward planning and effective day to day control of the technical support team, whose activities include:-

- operating systems support
- system security
- machine performance monitoring and tuning
- communications network design and implementation
- hardware configuration planning
- software products, implementation and support

The ideal applicant will have:-

- a knowledge of network design, preferably ICL
- in-depth knowledge of support of large mainframe operating systems, preferably VME
- the ability to participate in the formulation of long-term plans
- the ability to set objectives within overall plans and to lead a team to meet these objectives.

The position offers an attractive salary, company car and other fringe benefits, including medical aid and pension schemes. The company will assist with relocation expenses and free transit accommodation will be provided for the first three months.

Interested applicants should write to: Mr. J. Scholes, Personnel Officer, Consolidated Gold Fields PLC, 49 Moorgate, London EC2R 6BQ.

**Gold Fields**

Gold Fields of South Africa Limited

(8120)

## Senior Systems Engineer Computer Graphics-Income Negotiable

Our client, a young and dynamic U.S. Corporation, designs, manufactures, markets and services raster graphic display processors and sub-systems used in a wide variety of interactive computer applications.

Achieving growth rates of over 40% p.a., their U.K. subsidiary located near London wishes to appoint a top performer to the Senior Systems Engineering position.

Responsible for pre sales support the right candidate will have a strong selling awareness and will make a significant contribution to the achievement of U.K. sales objectives.

He/she will most likely be a graduate with 4/5 years sound commercial applications experience and will preferably have graphics and/or CAD/CAM experience.

The Rewards This is a job for a self-motivated performer and high achiever and the income package will be negotiable and geared to attract a person of the right calibre.

A company car and employee benefits available consistent with a progressive corporation will also be available.

Applications will be strictly confidential Write now (enclosing CV) or telephone in the first instance to Pat Rafter, Managing Director at (0001) 606644 for an Application Form, Monday to Friday 9.30 am to 6.30 pm quoting reference number LX38. Automatic answering operates outside these hours.



### Insight Consultants

IMPC (Ireland) Limited,  
Insight House,  
20, Upper Fitzwilliam Street, Dublin 2.  
Telephone: (0001) 606644

(8120)

## SOCIAL & COMMUNITY PLANNING RESEARCH

### PROGRAMMER

SCPR, an independent social research institute requires a programmer to join its team concerned with the processing and analysis of data from a series of individual research studies, and with the development of a variety of related and general applications.

The Institute has links to an external VAX computer running UNIX, but an increasing number of applications are being developed to run on in-house microcomputers. A sound computer background, adaptability and the ability to communicate with non-computing staff at all levels are essential for the job. Experience in handling survey data would be a distinct advantage.

Salary in the range £7-10,000 according to experience and qualifications. Please write or telephone to obtain further details and an application form to the Data Processing Director.

35 Northampton Square, London EC1V 0AX. 01-250 1866

(8120)

## SALES EXECUTIVES FOR IBM 327X TERMINAL MARKET

Computer Peripherals (Systems) Limited, the exclusive UK distributor of Telex Computer Products 327X terminals and associated equipment are seeking to significantly increase its sales force. Sales Executives currently selling to Data Processing Managers are being sought in the Home Counties both north and south of London and in the Midlands.

Telex are the leading 327X alternative to IBM in the US with an unrivalled range of high quality cost effective products.

Computer Peripherals (Systems) Limited has ambitious plans for growth in the UK in this fast moving and exciting market.

The Company sets realistic sales targets with specially structured incentive plans for new employees. £21 to £26K total earnings are readily achievable for an on target performance. Car is provided.

For more information phone John Lowe, Sales Director, on 01-278 7627.

Computer Peripherals (Systems) Limited  
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(8100)

## analyst programmer

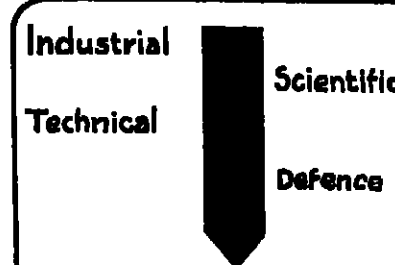
We are a long established and progressive company based in Norwich with a Printing Division of international reputation as well as Publishing and Retail interests.

We would like to hear from Systems Analysts who can immediately work on both new and existing applications for our Information Processing network. Applicants should have at least two years experience, have successfully implemented at least one new system and have COBOL programming ability. Working contact with ICL, ME29 and DB20 hardware is also desirable.

We offer excellent conditions of employment, career prospects, a wide variety of interesting work and assistance with relocation. Please write with brief career details to: G. Rowe, Personnel Manager, Jarrold Printing, Whitfriars, Norwich NR3 1SH.

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On PDP-11, VAX, Argus, SEL, HP1000, Intel, T.I., Motorola etc., with relevant operating systems. UNIX is particularly desirable.

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We are looking for ambitious people who already have sound experience in the programming environment and wish to develop their skills further.

A working knowledge of Hewlett-Packard computers would be an advantage, although re-training will be given to successful candidates not familiar with Hewlett-Packard. You should have a minimum of 12 months experience for these positions. Salaries, benefits and career opportunities reflect the professionalism we expect from our staff.

In the first instance, please write or telephone for an application form to Carole Graham, Hoskyns Group Limited, Springfield House, Springfield Road, Sale, Cheshire M33 1XS. Tel: 061-969 3611.

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(8113)

## THE ENGINEER

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## THE PROGRAMMING STORY BEHIND THE FRONT PAGE NEWS

The news is all from Morgan-Gramplan plc., a major publishing house responsible for 50 important titles, many of them required reading for people concerned with the advances of high technology in business and industry.

With the installation of a large new IBM system 38 configuration at our Head Office in Woolwich by leased line to an IBM 3083 connected at Croydon, we're now ready to take on the exceptionally bright, people-orientated Programmers who will write the synopsis for our future growth - in RPG and COBOL - and do much more besides. There will be opportunities for writing systems using micros, minicomputers and mainframe in a multi-site environment.

IBM 38 experience is not a requirement - we can provide all the training you'll need to use our advanced equipment to develop - then expand - a complete range of software systems. Everything to support exciting developments.

What we want from you is a minimum of 2-3 years' good programming experience and ability to liaise well with people in every area of our business from editorial chairs to finance and media sales.

Later, it could be possible for you to move out into these departments in a key interface role. So you'll need to be the kind of communicator who can bring about a clear understanding of computer systems amongst non-computing people.

If that's the sort of challenge you're equipped to take on, you can expect a starting salary up to £10K, a superb range of benefits and a lively and companionable environment - our staff club amenities include a restaurant, bar and sports facilities. We're also conveniently located close to Woolwich BR station and an excellent shopping centre.

Now for your programming story - everything you've done up to date. Send it to: Personnel Officer, Morgan-Gramplan plc., 30 Calderwood Street, London, SE18 6QH. Tel: 01-855 7777.

**MG**



# Lotus

## DEVELOPMENT CORP

### A WHOLE NEW FUTURE

Lotus Development Corporation is the world's foremost applications software development company. Founded in 1982, the company developed a revolutionary software package initially aimed at the IBM Personal Computer. Revenues in excess of \$3 million dollars are a testament to the market acceptance of the product. On February 14th 1984, the company launched a new product, Symphony, in the USA. Having dominated the US market place, Lotus are now committed to establishing a European Product Development Group. They now need to appoint the following key positions:

**SOFTWARE DEVELOPMENT MANAGER c.£23K**  
Reporting to the International Product Development Manager, you will be responsible for recruiting and managing a team of individuals to successfully complete the intended migrations of Symphony. You will need at least five years experience of software development, having gained a degree in Computer Science or related discipline. Experience with Intel 8086/8088 microprocessors, MS-DOS and personal computers is desirable.

**PRODUCT MANAGER c.£23K**  
You will be responsible for liaison between Lotus International Marketing and Product Development. Your key functions will be to co-ordinate the necessary software development, documentation, testing and production of the products. The position will require project management experience co-ordinating multiple product development teams under deadline commitments. It is vital that you are well organised and are able to communicate and relate on technical and human issues.

**QUALITY ASSURANCE/DEVELOPMENT SUPPORT MANAGER c.£26K**  
You will be responsible for staffing and managing the day-to-day activities of the QA/Support group in Product Development. You will develop effective procedures for testing and support. You will be responsible for ensuring that the product is of the highest quality and that the support team is well trained and motivated.

Previous experience in the above roles is essential, together with a degree in Computer Science.

**VAX SYSTEMS MANAGER c.£28K**  
You will be responsible for the day-to-day operation of the VAX systems in the Product Development Group. You will be responsible for ensuring that the systems are running smoothly and that the support team is well trained and motivated. You will also be responsible for the development of new software for the VAX systems.

Lotus Development Corporation's track record of success is unquestionable. As such, they are in the upper percentile for both technical expertise and calibre of staff.

All of the positions carry a high basic salary plus company benefits including a car allowance where appropriate. For further details please telephone Tony McGrath on 01-637 9611 or send your CV to Management and Executive Selection.

## ANALYST/ PROGRAMMER

HONEYWELL L6

c. £10,000 + Relocation

Our client, based on the Bucks/London borders, is part of the L.R.C. group. They have recently installed a Honeywell L6 which will shortly be upgraded to a DPS 6. They wish to appoint an Analyst/Programmer to liaise and eventually take over systems being implemented by a Software House and subsequently move into a Systems Manager role.

Applicants will probably be in a Programmer or Analyst/Programmer role with experience of Honeywell L6 Cobol and/or Screenwrite. Strong user skills are essential as there will be a considerable amount of contact with management departments. The successful candidate will also have the opportunity to work with microcomputers.

In return our client offers a good starting salary with regular reviews, 22 days' holiday, NCPs, relocation assistance where necessary and other large company benefits. If you are able to work on your own initiative and enjoy a challenge contact Mike Harmer for further details.

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## In the field of Office Automation, there's always room to grow Software Engineers £8,500-£15,000

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For further information, and a confidential appointment, please contact Shilvon Riordan, on 01-630 1433 (office) or 01-670 8717 (home)

**JUNIOR LEVEL** 2-4 years Experience - Office Automation experience not essential.  
**SENIOR LEVEL** 4 years + Experience - Project Management experience desirable. Knowledge of at least one of the following - CORAL, PASCAL, 'C', PL/M 86, UNIX/XENIX, INTEL (8086/8088), COMMUNICATIONS, GRAPHICS, LAN. The accompanying benefit package is excellent - including one or two unusual benefits - and reflects both the company's success and its commitment to employee care. The working environment is modern and comfortable - but perhaps the most exciting reason for joining is the opportunity to work with some of the most exciting state of the art technology today.

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IBM 5100 DPX PROGRAMMERS  
IBM DOS CICS COBOL DL/1 PROGRAMMER/ANALYSTS  
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IBM 4300 MVS PL/1 ANALYST/PROGRAMMERS  
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(R178)

# MVS SYSTEMS PROGRAMMER

We are the Technical Support Group responsible for providing the facilities and technical guidance/lead for some of the most ambitious information/business systems in Europe.

Reporting to the Systems and Programming Manager, and deputising for him on occasions, you will have considerable responsibility, within a close knit team, for ensuring that optimum usage is made of our mainframes and all manufacturers and proprietary hardware and software.

As well as this day-to-day involvement, in performance monitoring and tuning, you will also have to carry out the forward thinking aspects of capacity planning.

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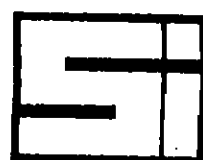
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(R137)



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Opportunities exist for talented men and women to fill positions ranging up to Senior Team Leader level, requiring the ability to plan, organise and control the work of small teams.

Experience of programming for real time applications is essential. Exposure to a modern 16 bit microprocessor would be a distinct advantage.

In addition to excellent salaries, dependent on experience and abilities, the Company pay generous relocation expenses and subsistence allowances for those who need to move into the area.

To apply, please write with full curriculum vitae or telephone George Shaw on 01-549 9236 (24 hour answering service) for an application form.

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Norsk Data manufactures, sells and supports 16 and 32 bit mini computers and has achieved an average growth of 40% per year over the last ten years. Turnover in 1983 reached £82 million and Norsk Data are quoted on the London, New York, Oslo and Stockholm Stock Exchanges.

The U.K. company have doubled in size each year for the last four years enabling Norsk Data to purchase near Newbury a listed stately home in 110 acres, landscaped by Capability Brown, for their new U.K. Headquarters.

Based at Newbury, positions for Sales Executives exist in the following Sales Groups:

Industry  
Business Development Group  
Local Authorities and Public Utilities  
Ministry of Defence

Candidates should be aged between 25 and 40 of graduate level and have at least three years' sales experience with a major manufacturer of mini or mainframe computers, OEM or Systems House, proven ability of negotiating with major accounts or within the above sectors.

Knowledge of office automation, database management or information systems plus commercial applications would be advantageous.

Based at Newbury positions for Technical Sales Support exist in the Pre-Sales Support Group:

Candidates should be aged between 25 and 35, of graduate level and with proven pre sales experience within the computer industry. Expertise in FORTRAN and other technical programming languages is essential with knowledge of SNA, CQ3 and Computer Aided Engineering an advantage.

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To own a stake in your future telephone Kathy Sinclair today on 01-637 9611 or send her your CV to the address below.

(R144)

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## Real-Time Software CAREER OPPORTUNITIES

£9K to £15K neg.

NW England

The advent of information technology has created the need for highly advanced communications and message processing systems dependent totally on the quality, sophistication and innovation of system software. The opportunity to contribute to the development of future generation systems is currently being offered by a major international force in communications technology in the building of a new specialist team. Current opportunities exist for:-

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Ref: - W/171

### SYSTEMS ANALYSTS

Ref: - W/172

### PROGRAMMERS

Ref: - W/173

The ideal candidates will be:-

- 23 to 40 years of age
- Qualified to BSc or equivalent
- Currently employed within a Real-Time software environment (either commercial or defence)
- Conversant with Block-structured high level languages (eg. PASCAL, CORAL) and operating systems such as CONTEXT or RSX11

Some experience of Assembler on minis or micros would also be an advantage but training in all areas will be offered to successful candidates.

You will be involved in challenging work incorporating multi-processing and distributed processor systems in message processing, Command, Control and Information systems and packet switching. The software development will be on VAX 11/780, PDP/11's and 8086's.

The benefits include an excellent negotiable salary and working environment with a full relocation package for the successful candidates with the opportunity to become an integral part of a special team developing tomorrow's technology.

For an initial and confidential discussion please call Bob Archibold on Newbury (0635) 33445 quoting the appropriate reference number or write in strict confidence to:-

**ARCHIBOLD RAE CONSULTANTS LIMITED,**  
(High Technology Search & Selection)  
7, London Road, Newbury, Berkshire RG13 1JL.  
Tel: Newbury (0635) 33445.

ARC

(8165)

## O.E.M. SALES — KEY APPOINTMENTS HIGH BASIC SALARIES — O.T.E. £20,000+

A rapidly expanding and profitable major BRITISH company involved in the Design and Manufacture of Microcomputer Systems seeks Sales Professionals to sell their products to the OEM market place.

The vacancies, which are entirely due to the speed of controlled growth (50% growth target 84/85) are in two vital areas of the company's activities viz:-

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All products represent the latest State of the Art Technology and the Sales Force is backed up by strong Management and Support Teams.

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If you have experience in selling to OEM's or Key Accounts either for a Manufacturer or Distributor and can provide evidence of a good track record in system or card level sales, contact us quickly, in the strictest confidence. We will arrange local interviews to discuss these Outstanding Opportunities.

Send your replies to Geoff Garside, Managing Director

Multibus is a trademark of Intel.  
UNIX is a trademark of Bell Laboratories.

**Garside Management Consultants Limited**  
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54, 58 Northfield Road, Kings Norton, Birmingham B30 1HT  
Tel: 021 491 1447 Telex: 334229

## SYSTEMS ANALYSTS PROGRAMMERS

to £13,000  
to £10,500

IBM 3083, MVS/JES 2, CICS, TSO/SPF — EASYTRIEVE

Established in 1919, this British-owned electrical company based in North London is a modern day success story with group profits for 1983 reaching £13.3 million, an increase of over 50% on 1982.

Following their commitment to Computer Processing with a strong directional strategy to MIS, the company has recently upgraded to an IBM 3083 running MVS.

Parallel developments are required to utilise the power of the new hardware, including commercial online systems and piloting CAD systems within technical areas of the company. Series 1 configurations are also to be implemented at each manufacturing location.

These developments promise to create an exciting and challenging period within the computer services department and we have been retained to assist in the recruitment of highly skilled personnel to complement the existing team.

Applicants for the SYSTEMS ANALYST positions should possess solid Analysis experience gained in an IBM environment and should have taken a project from design through to implementation; exposure to online systems and database techniques is desirable. Successful candidates, who will be self-motivated individuals with the ability to communicate effectively at all levels, will be involved at all stages of systems project development covering Financial, Marketing or Manufacturing areas.

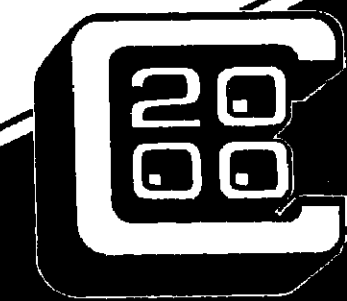
We are also seeking PROGRAMMERS to develop online and batch programs working as part of a project team assigned to a particular development area. A strong IBM COBOL background is the prime requirement for these positions. Although a knowledge of CICS, Database and/or EASYTRIEVE would be advantageous, both in-house and external training will be given where necessary.

In addition to a competitive salary and the opportunity to work in a progressive and demanding environment, the company offers a full range of benefits including Pension and Sick Pay schemes, Share Ownership Option, Saving Related Share Option, Subsidised Restaurant and five weeks' holiday.

For further details of these positions, please contact MELVYN DEARLOVE at Computer Two Thousand.

(8187)

Computer Two Thousand Ltd  
Data Processing Consultants  
217-218 Tottenham Court Road  
London W1P 9AF



Tel: 01-636 7584 (24-hrs)

## Contracts in America!!!

\$40,000+ per annum

We have been retained by a major company in the United States of America to supply 30 experienced computer programming personnel for 12-month contracts. The locations are varied but include Baltimore, Boston, Washington, Chicago, Philadelphia and New York. Prospective candidates should be available to start any time between now and June 1984. The skills required are:

- ★ IBM COBOL IMS and ADF
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- ★ IBM PL1 with IMS DB/DC
- ★ IBM MARK IV
- ★ HONEYWELL GCOS COBOL with DM IV
- ★ ICL or IBM IDMS with COBOL
- ★ UNIX and C

An excellent package is offered and will consist of the following:

- ★ Excellent rates of pay (\$800-\$900 per week)
- ★ Return air fare
- ★ Accommodation assistance
- ★ Car assistance
- ★ Medical insurance
- ★ Tax and Legal advice
- ★ Support from our U.S. office in Boston

Programmers who are currently in permanent positions are welcome to apply for these positions.

Interviews will be held in Central London during March and April.

To discuss these opportunities please telephone Steve Whiting or Sandra Carey on: Farnborough (0252) 516141.

(8138)

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**TRIDENT  
COMPUTER SERVICES GROUP PLC**

Licensed by the DOE as Employment Agencies and Employment Businesses SE 7676 and M 1651

Job no 1170



## DIRECTOR - INTERNATIONAL Management Information Systems

Interviews in Surrey 13 and 14 March

An American multi-national metal packaging manufacturer with its European Headquarters in Surrey seeks an experienced data processing professional to be based in the UK but who will travel regularly throughout Europe. This position requires a pragmatic individual who possesses creative skills and who is sensitive to a multi-national environment. A very attractive salary and benefits package, including car, will be provided.

Responsibilities include the management of an international data centre (IBM 4341), common systems development functions, serving European sites (IBM 534-36) and coordination of MIS activities in UK, Ireland, Germany, Spain, Italy and Cyprus. International exposure and knowledge of European languages would provide a significant advantage. Knowledge of accounting, manufacturing, inventory/distribution applications is desirable.

If you are a dedicated results orientated manager who possesses a high level of strategic and planning skills and who enjoys challenge please contact Mrs Suzanne Birch on

Bracknell (0344) 55777 (day) 24117 (evening)

ceb executive Professional Recruitment Consultants Limited  
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Kongsberg Systems Technology Limited, a member of the Kongsberg Group of Companies, have a long-standing reputation as innovators in Computer Aided Manufacturing.

Opportunities exist for the following CAD/CAM specialists:

### PROJECT LEADER

A FORTRAN specialist, who can lead a small team of software engineers in coding, design, coding, testing, installation and support of software for mechanical NC tape preparation. The successful candidate will possess a degree or equivalent in a science or engineering subject and have at least 4 years' FORTRAN experience using DEC computers running under IAS and/or VMS.

### SOFTWARE ENGINEERS

NC part programming experts, to be part of the above team of software engineers. The successful candidates will possess recognised mechanical or production engineering qualifications and have at least 3 years' experience using a CAD/CAM system. The ability to write post processors in FORTRAN would be advantageous.

Highly competitive salaries are offered, together with 20 days' annual holiday, free BUPA and Life Assurance Scheme. A contributory Pension Scheme is available after qualifying period.

Please write, with c.v. or telephone for an application form, to:  
Sally Pearson, Kongsberg Systems Technology Limited,  
Priors Way, Maidenhead, Berkshire SL6 2HP.  
Telephone: (0628) 39292.

Ferranti plc

## Programming Management ...at the centre of a high technology, expanding company

The Internal Computer Services department, based at Hollinwood, Manchester provides commercial data processing services to the Ferranti Group companies — using ICL 2966 mainframes and ME29's. Conversion from George III to VME 2900 is currently underway.

As Assistant Programming Manager you will be responsible for the organisation and motivation of 15 programmers in four project teams engaged in writing new applications programs for financial and manufacturing systems. Current developments include the use of IDMSX and TPMS.

The planned expansion and development of our Internal Computer Services will lead to broader responsibilities and offers excellent scope for career extension. Salary and benefits are those expected of a large market leading company. Candidates with relevant ICL Cobol experience and evidence of managerial ability should send c.v. or telephone for an application form to: J.H. Hughes, Personnel Manager — Central Services, Ferranti plc, Hudson Street, Hollinwood, Lancs. Tel: 061-681 2000.

**FERRANTI**  
selling technology

# REAL-TIME SOFTWARE ENGINEERS

Westinghouse Signals Ltd., a subsidiary of Westinghouse Brake & Signal Company Ltd., founded in 1881, has achieved a world-wide reputation for safe and reliable control of railway systems in the areas of signalling. Considerable experience, allied to an in-depth knowledge of advanced technology, has enabled Westinghouse to pioneer many new concepts in this field of engineering. To maintain their position as market leaders, Westinghouse wish to recruit a number of experienced but flexible Software Engineers to work on major new contracts worldwide. Current projects include work on significant railway investments in New Zealand and Singapore. Opportunities exist to participate in all stages of the project, from the initial design through to site testing and commissioning activities.

The majority of systems are based on Hewlett Packard 1000 series minicomputers with programming being done in HP Assembler language. More recent systems have been implemented using Coral 66 and there are several projects involving Z80, Intel 8085 and TI9995 micro-processors being developed currently.

**Westinghouse Signals**

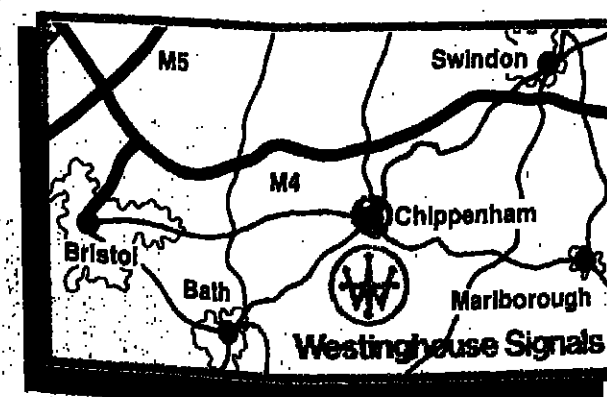


### Software Project Leader

You are likely to have a minimum of six years experience in real-time software design and implementation, and experience of working with mini and/or micro computers using high and low level languages. You will be expected to lead a team of software staff, the size of which depends on the nature of the project (anything from 2 to 7 is typical). A proven track record in the implementation of projects from concept to installation is essential.

### Senior Systems Analyst

You must have experience of working with mini or micro computers using high level and low level languages. With a minimum of four years relevant experience you would be expected to join a software team and undertake detailed systems design work. Previous team leadership would be an advantage.



### Systems Analyst

Having spent at least three years in a real-time engineering environment and gained experience of software design, coding and integration you would be expected to undertake system and program design work to the constraints given by more senior members of the software team. Additionally, you would be expected to oversee the work of Programmers and Analyst/Programmers who will implement your designs. Again, experience of mini or micro computers, using high or low level languages is essential.

### Analyst/Programmer

You will have experience of software coding and implementation, previous program design experience would be an advantage. Knowledge of such languages as Coral, Algol, Pascal and Assembler, as well as exposure to mini or micro computers is required. Working closely with the

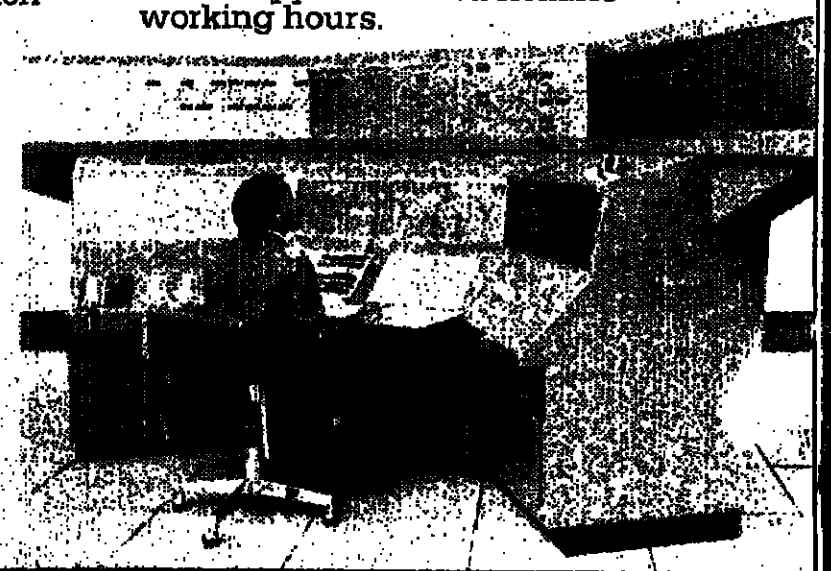
programmers, you will be required to implement the designs provided by the Systems Analysts.

### Programmers

A number of opportunities exist for Programmers with a minimum of 12 months experience of software coding and integration, preferably gained in a real-time engineering environment. Knowledge of Coral and/or Assembler is a requirement, but other high or low level language knowledge gained on mini or micro computers would be considered.

In addition to a very attractive salary and excellent career opportunities, Westinghouse offer a number of additional benefits which include an outstanding relocation package where applicable and flexible working hours.

For further information, please contact Mike Beesley, Sanderson Computer Recruitment Ltd., 41/43 Baldwin Street, Bristol 1. (0272) 211741. When writing please supply a telephone number at which you may be contacted.



**Sanderson**  
COMPUTER RECRUITMENT

# SYSTEMS AND PROGRAMMING

### IBM PROGRAMMER/ANALYST CITY £9,000 + Mortgage

To join a small team developing and maintaining CICS, DB/1 programs. Training will be given to candidates with 1-2 years IBM COBOL experience within a DOS environment. This is an excellent opportunity for a keen ambitious young person who would like to move into an on-line environment using the latest Database techniques. Excellent benefits package which includes subsidised mortgage, health insurance and STP.

C/W 2463

### ICL SYSTEM PROGRAMMERS LONDON £13,000

An exciting opportunity has arisen for a number of systems programmers with 3 years + 1 FIVE/IDMS to become involved in a major development plan over the next couple of years. The company operate dual 2956 with DRX operating system and SCL. The senior position would suit someone with either management or supervisory experience. Company benefits include a house purchase scheme, season ticket loans, etc., after a qualifying period.

R/W 4048

### IBM COBOL PROGRAMMERS CITY TO £11,500

Can you offer around 3 years COBOL, CICS and DB/1 experience, and do you wish to enhance your professional skills through challenging and demanding projects? Then this job is for you. Very interesting development projects and excellent prospects.

A/W 4332

### UNIX CITY £12,500

My client, an international banking group, requires an experienced programmer for its D.C. expansion plans. This will be a challenging appointment with an organisation dedicated to making the best use of its sophisticated programming facilities. A thorough knowledge of UNIX is essential on any machine and experience in a financial environment would be an asset. All banking background apply.

M/W 4256

These positions are just a brief selection from our extensive database of jobs in London and the South-East. If you desire see a position advertised for your particular skills, or are considering a decision as to a change of hardware, a quick telephone call will put you in touch with a consultant specialising in your field. 70% of jobs in this industry are never advertised. Why not let us tell you about some of them? We look forward to hearing from you.

### WANG/PROGRAMMER CITY £11,000 neg.

This is an excellent opportunity for a D.P. professional to take up a key position within this well established insurance company. The company house Wang VMS and computers and ideal candidates will have a minimum of 2 years experience using COBOL. You will play an integral part from feasibility to implementation of a range of insurance and business systems. This is an interesting position offering career prospects, excellent development projects and a pleasant and flexible working environment.

M/W 4345

### IBM ALL AREAS £8-14,000

We have too many positions to list. Our clients are in the banking, manufacturing, retail, insurance and software fields and are seeking from 12 months to 5 years IBM experience, either with COBOL, ASSEMBLER, RPG II or RPG III. If you would like to further your career and increase your salary in a challenging environment, call us for further details of these positions.

COBOL

### ANALYST/PROGRAMMERS FOR ICL KIT LONDON AND HOME COUNTIES £10,000

I have a number of companies with openings for ICL people whose experience has been gained on any ICL configuration. My clients include insurance companies, technical services and software houses, all offering technically interesting and challenging work to the right applicants. If you have 2 years COBOL experience on ICL under VME or VME/B or ME29 with IDMS, or TPMS while you could be of particular interest to any number of these companies. The work offered is mainly development projects, and relates very much to experience, but will be commensurate with your background. I telephone now, to discuss your requirements and career prospects.

B/W/GBN

### IBM MVS COBOL W. LONDON TO £12,000

My client is internationally renowned in the leisure industry and is seeking an analyst/programmer to join a user support group, developing and supporting accounts, sales and marketing applications. They have recently converted to MVS and require a minimum of 2 years IBM COBOL, preferably with MVS and on-line experience to join a CICS team. Lots of user contact and sound promotion prospects.

C/W 4330

### FORTRAN PROGRAMMERS MIDDX. £10,500

An interesting opportunity with a leading travel organisation offering progressive career openings to skilled Fortran programmers. Initially, you will work in small professional teams developing on-line transactions, eventually becoming responsible for seeing projects through from feasibility to implementation. This company's exceptional growth rate has been achieved by its clear business objectives and this will be a chance to join an expanding outfit and make a valuable contribution to its future.

M/W 4246

### ICL PROGRAMMERS - ALL LEVELS CENTRAL LONDON £9-12,000

My client is in the financial sector and requires a number of additional COBOL programmers at all levels to join their development team. The ideal candidates should have 2 years + ICL 2900 VME and some experience of IDMS or TPMS. QM you may have a good knowledge of Assembler or Pascal on any ICL machine. This is an outstanding opportunity to further your skills and become involved in an interesting and stimulating environment.

B/W 4000

### VAX EXPERTISE WANTED! TO £15,000

Based in Middles, my client, a major U.K. systems house, leaders in the field of Turnkey Systems, is expanding, thus it requires a number of D.P. professionals. You must have 18 months + D.P. experience in either COBOL, and/or BASIC and have a good knowledge of DEC/VAX machines. There are plenty of prospects for sampling efforts, and this could involve world-wide travel. Besides a good salary, with regular reviews, benefits include a bonus scheme, free life insurance, and B.U.F.A.

H/W 4346

### HEWLETT PACKARD - COBOL TO £12,500

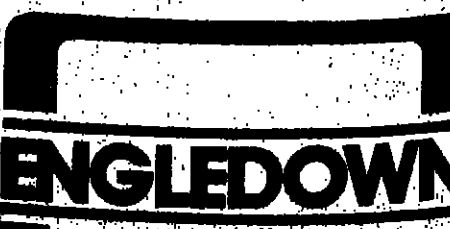
Are you currently an H.P. Programmer with little or no analysis involvement and yet the ambition to succeed in that area? This London based media organisation dedicated to the computerization of their company can offer you extensive user liaison, specification design and analysis training. You must display a thorough knowledge of COBOL, FPD000 and its utilities. For those who already have analysis skills, the chance is offered for you to test them in a challenging development environment. Call now for details.

H/W 4033

### DEC - COBOL - BASIC+ DIBOL £8,000-£13,000

Looking for a position which can offer you extensive customer liaison, analysis involvement and travel, whilst developing exciting systems in a commercial and financial vein? My Surrey based clients can give you just that! To qualify you must have experience of one or more of the following: COBOL, BASIC+2, DIBOL, RSTS/B or RSTS/M-M. At the present time the company deal mostly with DEC/PDP machines although progression to VAX/VMS is envisaged in the near future.

H/W 4222



COMPUTER PERSONNEL CONSULTANTS

Brushfield House, 12 Brushfield Street  
Bishopsgate, London E1 6AN  
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# IBM RETAILING APPLICATIONS

## We're never afraid of change

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**Salaries £12-15K.**  
with IBM-based retail applications experience, a sound understanding of commercial disciplines, and familiarity with MVS and CICS.

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**Salaries c.£12K.**  
ideally with retail applications experience but essentially with proven expertise in COBOL and development applications using MVS and CICS.

You will join a dynamic department dealing, in teams, with finance; point-of-sale; stock analysis; buying; merchandising systems; and the vital area of developing statistical information to guide marketing and purchasing policies.

If you welcome change and have the experience we need, we'll make you welcome at Dixons. For further details please contact Christine Dutton, Personnel Manager, Dixons Limited, Dixon House, 18-24 High Street, Edgware, Middlesex HA8 7EG. Telephone 01-952 2345.

# Dixons

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Rural Suffolk

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**Servo Engineers**

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Write for application form or with C.V. to  
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Electronics Dept.  
W. Vinten Limited  
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Bury St. Edmunds  
Suffolk IP33 3TB  
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# Vinten

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We are a division of the highly successful DP Support Services Group which recruits both permanent and contract staff for the UK Computer Industry and as a result of continued business expansion we are seeking to recruit staff for our Piccadilly W1 based offices.

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## SYSTEMS ANALYST circa. £13,000 p.a. plus benefits ANALYST PROGRAMMER circa. £11,800 p.a. plus benefits

LONDON N1.

Glaxo, the well known multinational group of pharmaceutical companies with annual sales in excess of \$4,000 million are seeking to employ two additional people to assist in the development of management information systems for the parent company.

The environment is based on Hewlett Packard 3000 hardware running under MPE using IMAGE, ASK and GENASYS. Cobol is the main programming language.

### SYSTEMS ANALYST

Candidates should have a minimum of 4 years d.p. experience together with online and database skills. Duties will include the analysis and design of management information systems in line with end user requirements and some supervision and training of junior staff. Preference will be given to candidates with a good financial background and previous experience with HP 3000 kit would be an added advantage.

### ANALYST PROGRAMMER

Candidates must have at least 2 years d.p. experience including 1 years analysis and should have worked on HP 3000 equipment previously. Online development skills will be regarded as a distinct asset as would any knowledge of financial systems and/or modelling languages.

### FURTHER INFORMATION

The positions are based at Glaxo Exports headquarters in London N1 with travel facilities close to hand. The company maintains a high level of investment in its personnel has an excellent reputation for training and development, and can offer a wide variety of career progression. In both cases candidates should have been educated to degree level.

### INTERESTED?

For a fuller presentation of the challenges and opportunities presented by these two positions please contact Chris Morrow of Total Selection Ltd. who have been retained to advise on the appointments.

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We want to hear NOW from those people who either have a success record in electronic capital equipment sales, or who may be general engineers familiar with current electronics technology and have the personal potential to succeed in ATE sales.

The package is excellent. High earnings, plus company car, comprehensive benefits, exceptional product/sales training, and every prospect of rapid progression within a world leading organisation with an excellent product.

If you have the personal drive, professional commitment and energy to succeed in a dynamic and demanding environment, CALL ME, MIKE BEER, on 01-242 9356. Alternatively send your CV to me quoting reference CW 1812 at:

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24 hour answering service  
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# GST

Computer Systems Limited

## CAD/CAM SOFTWARE PROFESSIONALS

### Cambridge

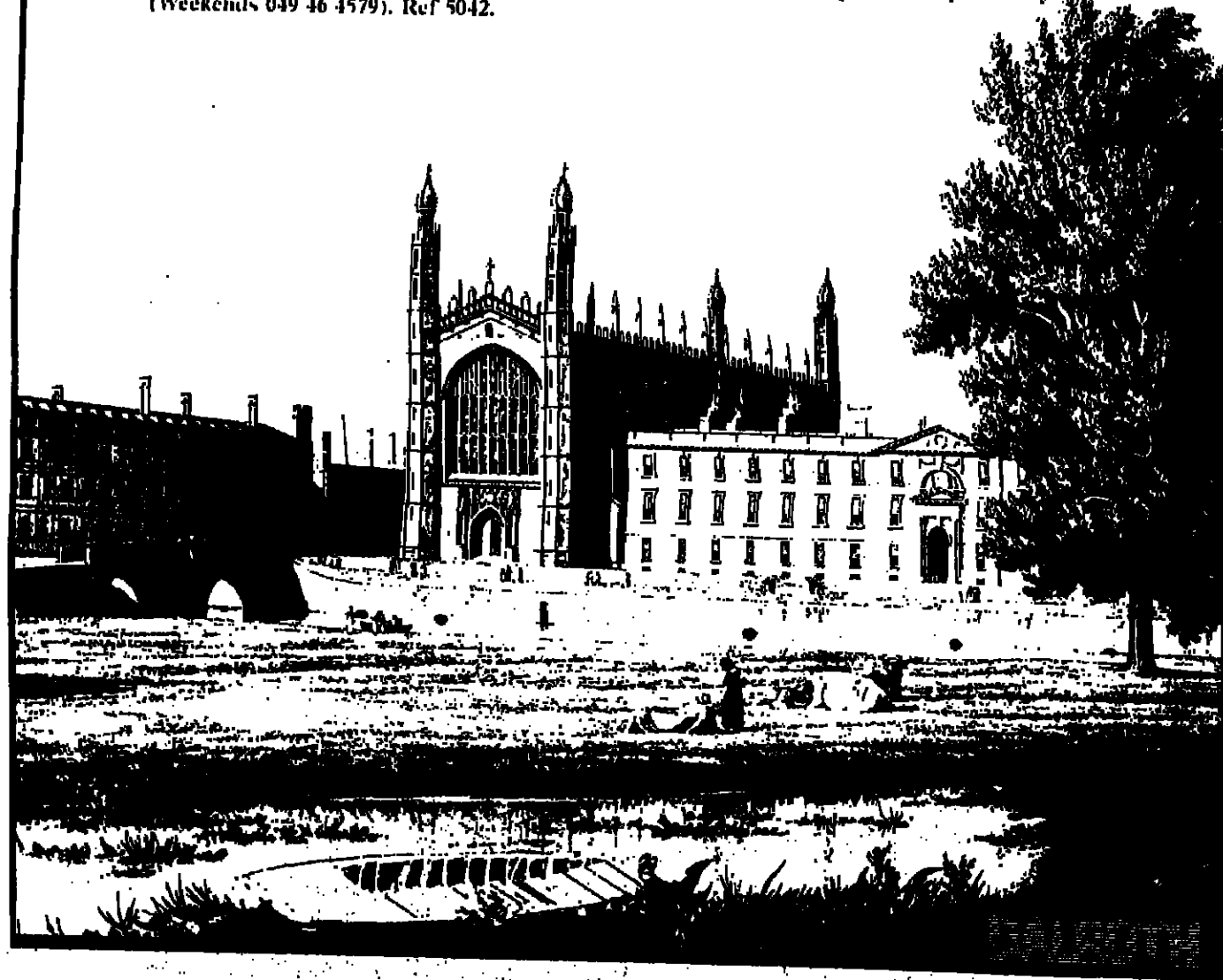
£8000 to £16000 per annum + car and benefits package over £3000.

GST requires creative professional Programmers, Designers and Consultants who will enhance its CAD/CAM group working near Cambridge, a beautiful and historic city and arguably Europe's leading centre of computing excellence.

GST is involved in many interesting new CAD/CAM projects including image processing, design and process industry software, engineering management systems, 3D modelling, graphics and related systems.

Applicants with proven ability, and experience of Fortran and one or more of Prime, VAX, Apollo or IBM will have a distinct advantage. Within the CAD/CAM group you will have the opportunity to contribute to software development projects or to work closely with clients to help them use CAD/CAM equipment effectively in British industry.

To apply please send a full CV to GST's consultant Jenny Dalrymple-Hay (or Ian Murray West) at Dalroth and Partners, 4 Half Moon Street, Mayfair, London W1 or telephone for more information or an application form on 01 493 2947 8am - 10pm Monday - Friday. (Weekends 049 46 4579). Ref 5042.



## SENIOR COBOL PROGRAMMERS

to £14,000

3 to 4 years in commercial environment. To work on VAX 11/750 in CROYDON.

## TECHNICAL SUPPORT ANALYST

£10,000 +

IBM background. Ideally mainframe and GSD. Based in WEST SUSSEX to support 20 European installations.

**KPG**  
01-948 5922

Ring: Peter Hennessey  
on 01-948 5922  
or 0293 516322  
(Eves/Weekends)

## CONTRACT?

**CICS TECHNICAL SYSTEMS DESIGNER**  
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## MICRO COMPUTER SPECIALIST

with good technical background in software and hardware.  
Proficiency of French helpful but not required.  
Main responsibilities would be to help integrate the use of an important micro micro with existing mainframe VAX/Dec systems.  
Please send detailed cv, references, photo, to:  
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Fontainebleau Cedex

**gsi**  
général de service informatique

## Two system analysts

Who should be in possession of:  
• a good knowledge in French, • a university degree, • 3 years experience minimum, • a perfect knowledge of IBM assembler, • experience of application with IBM pars system.

We offer:  
• a stimulating work environment within a dynamic and highly motivated group, • excellent prospects for promotion  
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Please send C.V. to GSI, Mme Pereira, 5 Villa Brune 75014 Paris (France).

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**SALES MANAGER**  
£17k BASIC plus guarantee £20k - £25-30k

Our client addressing the commercial market is looking for professional salesmen, who have total business solution selling experience to end user. Or similar dedicated market hardware sales experience.

If you are looking for a challenge and have promotional goals, want to be measured by results, and can develop vertical markets by implementing sales and marketing strategies, then demonstrate your commitment for success and target for the top by joining our client, whose main aim is to be the number one in total business micro distribution. If living London, Home Counties, South or Midlands call Jackie Higgins.

01-543 4844  
Ad Ref: 1988

**ALLTRONICS PEOPLE (AGY)**

## BUTEL BUSINESS SYSTEMS

### COBOL programmers—the way ahead

If you are a COBOL programmer with at least 1-3 years experience of commercial programming and/or systems analysis, then we would like to hear from you.

Butel is a leading Data General Software House, specialising in turnkey projects and packages on both 16- and 32-bit computers. In our fast growing business there are excellent opportunities and rewards. Salary negotiable up to £10,000, according to experience, plus BUPA and other benefits.

**BUTEL**  
Technology for business

Please write with details, or telephone.  
Susan Frampton,  
Butel Business Systems,  
Brook House,  
88-100 Chertsey Road, Woking, Surrey, GU21 5BE.  
Tel: Woking (04562) 28111

(1132)

## YOUNG PROGRAMMER

1-2 YRS COBOL?  
HEWLETT PACKARD?  
LIKE USER CONTACT?  
PLENTY OF POTENTIAL?

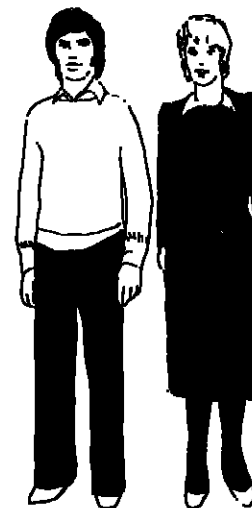
**£9500**

**The company:**  
We are an international Marine Insurance company based in Central London.

**Our requirement:**  
An enthusiastic, flexible young Programmer who is looking for an environment offering scope for advancement (both technical and personal).

**The department:**  
Busy, expanding and involved in developing systems on a HP3000 using IMAGE QUERY VIEW QUIZ QUICK AND ADAGER

**For early interview:**  
Phone (preferably) or write to Roger Wilkins at the London address below.



**TCR**

**Targa Computer Recruitment**

19 Poppleton Street London EC2V 9AS  
Monaco House Bristol Street Birmingham B5 7AS  
Telephone 01-588 9871  
Telex 25851  
Telefax 021 632 2045  
Telex 334237

## SOFTWARE TEAM LEADER

**Success:** Successful, local, small and British! For many years this company has designed, produced and sold a range of systems for communications users (non-military). They now have corporate approval for expansion, new products and new software (eg UNIX and C).

If your background includes Intel or PDP/LSI software then take your first step into technical management - initially under the guidance of a resident consultant.

The mood is buoyant, the management are supportive and you will get the backing and resources to implement your ideas.

Ring Allen Sanders for further details now!

Ref: CA288 (1157)

**ab executive (kingston) ltd**

59 Eden Street, Kingston-Upon-Thames, Surrey. Tel: 01-549 6441 (24 hrs)

## Analyst Programmers

LONDON W1 up to £12,420

The Logistics and Offshore Management System is a major project within British Gas, designed to provide systems resources for both onshore and offshore activities in the Morecambe and Rough Fields. We currently wish to recruit experienced Analyst Programmers for our London offices.

These are key positions with involvement in all stages of the introduction of a new fully-integrated, interactive computer system - from requirement analysis and design to testing and implementation. You will be part of a project team involved in programming and systems development, using advanced computing techniques on Data General hardware. While based in London the post calls for some travel to hardware sites and occasional visits to offshore installations.

Applicants, male or female, will ideally hold a degree in numerate discipline and have extensive DP and programming experience.

Salary is in the range £10,964 - £12,420 including Inner London Weighting. Benefits are those normally associated with a large progressive organisation.

Please write with full personal and career details, and quoting ref REA/10132/060, to Assistant Personnel Manager (HG Services), British Gas, 59 Brynston Street, London W1A 2AZ.

Closing date for applications: 15th March 1984.

**BRITISH GAS**

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(01) 661 8080

## STORAGE TECHNOLOGY

are expanding their product range for 1984 to include laser printers, optical disks, tape accelerators and the 3380 compatible disk drives.

To help us meet this exciting challenge we urgently require the following personnel for our European Training Centre in London.

## TECHNICAL INSTRUCTORS

Salary and package are commensurate with this position in a successful and expanding Company.

If you feel you have the necessary background and qualifications for this position phone Pat Humphrys on (01) 847 2202 or send your c.v. to:

**STORAGE TECHNOLOGY (EUROPE) LTD**  
141 Clocktower Road  
Isleworth, Middlesex TW7 6DT

**StorageTek**

(8172)

## Contracts in the North

P-E Computer Services Limited, a long established software house, regularly supplements its own staff resources with freelance computer professionals. Currently we have many requirements for contracts starting over the next month. All grades of staff are required to work both in the north and overseas.

Whether you are available now, in the near future, or are just considering freelance work for the first time, discover P-E's approach to freelance employment by telephoning or writing to Peter Moore at the address below.

**PE**

**P-E Computer Services Limited**  
212 Washway Road, Sale, Cheshire M33 1RN. Tel: 061-905 1770

## ICL Programmers

### Keep your options open

To £11,500

Primarily concerned with prestigious department stores, this public company has recently established a small DP Audit Team, to enhance the operational and financial effectiveness of its corporate audit function. You will have the unique opportunity to view all aspects of the company's nationwide business and advanced computer developments, using a range of ICL, Honeywell and IBM equipment.

Your responsibility as Programmer is essential for further DP Audit development and requires a mature personality and business awareness. You will be programming to produce audit software, using audit packages and Cobol programs. Although based in central London, you will regularly work independently at the group computer centre in Swindon.

London and Swindon

Ideally you should have 18 months commercial programming using Cobol on ICL 2900 under VME/B, with a good working knowledge of MAC, and preferably experience of IDMSX database and general ICL utilities. You will be encouraged to advance your career by in-house and external training, and have an exciting range of promotion opportunities.

Attractive benefits include a 9-5 working day, staff discount, free lunches, travel and hotel expenses. Candidates will be considered from either London or Swindon locations.

To arrange an early interview, phone Susan Atkinson of Cripps, Sears & Associates Ltd., Personnel Consultants, 88-89 High Holborn, London WC1V 6LH. Tel: 01-404 5701 (daytime) or 01-838 1580 (evenings or weekends).

**Cripps, Sears**

(8173)



# PUBLIC SECTOR APPOINTMENTS



## Division of Computing Information Technology

Principal Lecturer  
Senior Lecturer/Lecturer II  
Lecturer II/Lecturer I  
Research Assistant (Lecturer I)

Additional posts are available due to expansion of courses in Information Technology.

Candidates should be graduates (or equivalent) with experience of programming in one or more languages (e.g. COBOL, Assembler, Pascal) together with experience in areas such as Data Processing, Systems Analysis and Design, Real Time Systems, Office Systems, Graphics, Operating Systems.

Computing will teach on a range of industry linked Higher Diploma sandwich courses, part-time BCS courses and specialist short courses.

Salaries:  
Principal Lecturer £12,519 - £15,744  
Senior Lecturer £10,683 - £13,443  
Lecturer II £7,215 - £11,568  
Lecturer I £5,649 - £9,735

(Also Allowance £280 p.a. in addition to the above rates.)  
Send SAE for further details and an application form to be returned within two weeks of the date of this advertisement to the Vice Principal, Slough College of Higher Education, Wellington Street, Slough SL1 1YU.  
 Berkshire is an equal opportunities employer.

**Slough College**

## GRAVESHAM BOROUGH COUNCIL ASSISTANT COMPUTER MANAGER £10,242-£11,052

We are seeking an experienced systems specialist to fill this important post which ranks second in the Computer Section.

Gravesham uses both ICL and Microdata processors. All new development is carried out on the Microdata SEQUOIA and 41 interactive terminals are spread throughout the Council's departments.

The successful applicant will head a team of four development staff and deputise for the Computer Manager.

Gravesham, bordering the Thames in North Kent, is within easy reach of London and the coast. Relocation expenses will be paid where appropriate.  
For application form and job description please contact Personnel Officer, Civic Centre, Gravesend. Tel: Gravesend (0474) 64422, extension 273. Closing date 9th March, 1984.

(7956)

## LECTURER II SENIOR LECTURER IN COMPUTING (2 POSTS)

£7,215-£13,443  
(Level of appointment and starting salary dependent upon qualifications and experience)

Required to teach on Computing and Information Systems degree. Applicants must have relevant industrial, commercial, research and/or teaching experience.

The Department is active on a number of research fronts and is keen to foster new activity in the field of intelligent knowledge-based systems. Applications are welcomed from researchers whose post-graduate/postdoctoral studies are nearing completion.

Permanent and temporary (2 to 3 years) contracts are available. Further details and application forms - to be returned by Friday, March 23, 1984 - are available from Personnel Officer, Plymouth Polytechnic, Drake Circus, Plymouth PL4 8AA. Tel: Plymouth (0752) 284039.

(8169)



Plymouth Polytechnic

University of Birmingham  
Centre for Computing and Computer Science

## CHAIR OF COMPUTER SCIENCE

Applications are invited for a new Chair of Computer Science which will become available from 1st October, 1984. The appointment is intended to strengthen the research base of the Centre for Computing and Computer Science and to provide a focus for research in a wide range of computer applications.

Application forms and further particulars from: The Principal, Stevenson College of Further Education, Bankhead Avenue, Edinburgh EH11 4DE. Tel: 031 453 6181.

(8281)

## NETWORK SUPPORT OFFICER

(Based at Aston Town Hall)

£8,781-£9,339 p.a.  
The network is currently available from 7.30 a.m. to 6.30 p.m. Support staff provide users with a telephone contact throughout this period.

Primary duties are problem resolution, network monitoring and equipment installation. Experience in operating data communication equipment is essential. Previous applicants will automatically be reconsidered. Please quote reference 097PD.

Closing date 16.3.84.

Application forms obtainable from The Personnel Office, Room A204, Town Hall, Annexe, New Broadway, Ealing W5 2BT. Telephone: 01-840 1985 (24 hour service).

(8185)

## DARLINGTON HEALTH AUTHORITY TREASURER'S DEPARTMENT COMPUTER SERVICES AND DEVELOPMENT OFFICER

Senior Administrative Grade - Salary Scale £7,404-£9,025 (Grading currently under review)

We are looking for an experienced person to maintain and develop the micro-computing network facilities within the Darlington Health Authority.

The person appointed will be responsible for the provision of computing services including the analysis, programming and day to day operational requirements of computer systems. The post holder will be working on ICL DRS systems equipment.

The post offers excellent training facilities (including ICL training courses) and good career prospects for persons of the right calibre. The present incumbent has been promoted within the H.A.S.

Application forms and job descriptions can be obtained from the Personnel Department, Memorial Hospital, Hollybush Road, Darlington. Tel: 0325 480100, ext. 3341/2.

Closing date March 16, 1984.

Applicants who have not heard by March 30, 1984 may assume that they have been unsuccessful.

(8178)

## UNIVERSITY OF LIVERPOOL Computer Laboratory HARDWARE ENGINEER

Applications are sought from graduates with experience in micro electronic hardware design and construction. To assist in the development of the hardware aspects of the computing service, particularly in the field of microcomputers and communications. A good first degree in Electronics or related subject essential.

Salary on scale, £7,190-£11,815 p.a. Possibility of promotion to scale rising to £14,125 p.a.

Further particulars and application forms may be obtained from: The Registrar, The University, P.O. Box 147, Liverpool L69 3BX.

Quote Ref. RV/228/CW.

(8074)

## UNIVERSITY OF GLASGOW Computing Service APPLICATIONS PROGRAMMER AND ADVISER

Interested in applications programming, and in helping others with their programming problems? Further particulars of a vacancy, for which the salary is currently in the range from £7,190-£11,815 p.a. (but due for revision w.e.f. 1st April), may be obtained from: The Academic Personnel Office, University of Glasgow, Glasgow, G2 8QQ. Closing date for applications: 30th March, 1984.

In reply please quote Ref. NO. 8100/2F.

(8087)

## ROYAL POSTGRADUATE MEDICAL SCHOOL (University of London) CARDIOVASCULAR RESEARCH UNIT COMPUTING IN CARDIOLOGY

Applications are invited for the post of Programmer in the Cardiovascular Unit. Candidates should hold a good honours degree and have experience in FORTRAN and Assembler Language programming.

The successful applicant will join a small and highly active team working on the analysis of cardiac function, or else will be responsible for writing software for the analysis and display of electrocardiographic biodynamic and nuclear medicine data.

Salary within Range 1B for Other Academic Related Staff, between £8,210 and £9,300 plus £1,168 London Allowance a year.

Application forms and further particulars available from the Personnel Office, Royal Postgraduate Medical School, 350 Duane Road, London W12 0NS quoting Ref. 2/207/CV.

Closing date: 22nd March, 1984.

(8177)

## SCOTTISH HEALTH SERVICE WEST COAST INFORMATION SERVICES CONSORTIUM Systems Designer/Programmer (2 posts)

Scale 9: £8,367-£10,277 OR Scale 4: £7,404-£9,025 (depending on experience)

Based in the Consortium's Headquarters in Paisley, two new temporary posts for an initial period of three years, to develop and support a package for use in G.P. doctors' surgeries. The package will run on a variety of micro and mini computers.

System design and programming experience required for both posts with a minimum of three to four years for Scale 9. Experience with micro and/or mini would be an advantage. May involve travel throughout Scotland.

Application forms and further particulars from the Area Personnel Officer, West of Scotland Health Board, Gilchrist House, Paisley PA1 1DU (Telephone: 081-847 0191, Extension 322). Closing date March 9, 1984.

(8037)

## BOX NUMBERS

Box number replies should be addressed to:  
Box Number  
The Computer Weekly  
Quadrant House, The Quadrant  
Bournemouth BH2 4AB

## monklands district council

The Council invites applications from suitably qualified and experienced persons for the following post:  
**DEPARTMENT OF FINANCE AND MANAGEMENT SERVICES**  
The Computer Services Section provides central computer facilities for the District Council and a network is being developed to integrate all the Departmental mini and micro computers. The Computers are mainly I.C.L. (ME29, 2004, System 25 and various DRS) but includes other manufacturers (Zilog, Hytec, Torch, Rai and Acorn).

## ANALYST PROGRAMMER

APV.£9,660-£10,554 POST REF C311

The successful applicant to this new post will be responsible for the systems analysis and programming of several important projects including the development of the Stock Control/Job Logging System within the Direct works Section, also a Schedule of Rates sub-system for D.L.O. Costing.  
Applicants must have at least five years' relevant computer experience, two of which should have been in systems analysis and must possess an appropriate University Degree or Membership of the British Computer Society. Experience in I.C.L. Cobol and/or experience on a System 10 or 25 will be essential and a knowledge of ICL communications protocols would be an advantage.  
N.J.C. Conditions of Service for A.P.T. & C. Staff will apply. A non-contributory Group Life Assurance Scheme is in operation as well as the Local Government Superannuation Scheme.

Application forms and job description are available from the Personnel Officer, Municipal Buildings, Dumbeth Road, Coatbridge ML5 3LF, Scotland (0238-24941, Ext. 231).  
Completed form must be returned by March 10th, 1984.

(8100)

## INNER LONDON EDUCATION AUTHORITY Computer Officer (Professional Officer B/C)

Salary range: £7,388-£12,688 plus £1,347 London Weighting  
This is a readvertisement

To act as Project Manager for a wide range of computer applications. Knowledge of developments in computer systems/hardware and proven analytical skills essential. The ability to organise, form good working relationships and contribute effectively to a small team is required. Will have good written and spoken skills.

Application forms and further details are available from the Education Officer (EO) Exch 181, Room 368, The County Hall, London SE1 7PS. (Please enclose an SAE.)  
Closing date for the return of completed applications to the above address 19 March, 1984.

Suitable for job sharing.

ILEA is an equal opportunities employer

(8100)

## TEESSIDE POLYTECHNIC We are an 'EQUAL OPPORTUNITY EMPLOYER' DEPARTMENT OF COMPUTER SCIENCE Applications are invited for the post of: DEPARTMENTAL PROGRAMMER

Post Ref. No. F.TD.59  
The successful candidate will join a team of technical support staff in a large academic department with wide-ranging teaching and research activities. Current equipment includes a VAX 11/750, an Ethernet system and a variety of micro-computers. Applicants should have experience of programming in high-level languages (Pascal and Cobol would be advantageous). Recent experience in an academic environment and a formal qualification in Computer Science are preferable, but training can be provided in specific areas if necessary.

Grade: Scale 4-6

Salary: £5,204-£8,712 according to qualifications and experience.

Further particulars and application forms from: The Personnel Section, Teesside Polytechnic, Borough Road, Middlesbrough, Cleveland TS1 3BA. Telephone: Middlesbrough (0542) 6181. Extension 414.

Closing date for applications: March 23, 1984.

(8174)

## M R C CLINICAL RESEARCH CENTRE (NORTHWICK PARK HOSPITAL) WATFORD ROAD, HARROW MIDDLESEX HA1 3UJ.

## MEDICAL RESEARCH COUNCIL HEAD OF COMPUTING AND STATISTICS DIVISION

Applications are invited for this senior post at the Medical Research Council's Clinical Research Centre in association with Northwick Park Hospital.

The person appointed will be required to head the computing and statistics service provided to the staff of the Centre and to maintain a close association with the computing service of Northwick Park Hospital.

The appointee will have overall responsibility for the research direction of the division and will be expected to carry out a personal research programme. Candidates should be of high scientific standing, should have a substantial background in computer science and the application of computer technology to biological and medical research.

The Clinical Research Centre may be visited by direct appointment and prospective candidates should discuss details of the post with the Director, Sir Christopher Booth.

Further particulars can be obtained from the Director's Office, Clinical Research Centre, Watford Road, Harrow HA1 3UJ. Telephone 01-884-8311, ext. 2220.

Closing date for applications: 17th March 1984

(8174)

## your appointments register

### Programmers

NCR/IBM/COBOL to £15K  
Insurance - Banking London - H. Counties - N. Eng.

COBOL/PL1/OS/CICS/IMS to £13K  
Commercial H. Counties - Midlands - Manchester

PROGRAMMERS to £12K  
DATAPOINT Berks

ICL/COBOL to £12K  
Two years' commercial experience Notts

DEVELOPMENT PROGRAMMERS to £14K  
CP/M + DEC Herts

RPG 2/3 to £14K  
Minimum one and a half years' experience Northants/Lancaster/London/N.E.

SYSTEMS PROGRAMMERS to £17K  
MVS CICS Midlands

BASIC/ASSEMBLER to £15K  
Mini/Micro Computers London

MINIs to £12K  
Commercial Applications Norwich/Croydon

IBM VS-FORTRAN/VSAM/ISPF to £11K  
MVS/TSO Sheffield

### Analyst/Progs

DEC to £15K  
Industrial Applications Bucks

IBM 34/38/4341 to £15K  
London/Home Counties/Lancaster

ICL 1500/ME29/2903 to £12½K  
COBOL Essex/Herts

IBM DOS/VSE to £17K  
Database and On-line Systems Morocco

### Hardware/Support

TECH. SUPPORT MANAGER to £16½K + CAR  
IBM DOS/VSE CICS IDMS Kent

SERVICE ENGINEERS to £12K  
DEC exp. London

TECHNICAL SUPPORT to £12K  
Pica Bucks./Coventry

OPERATION SYSTEM SUPPORT to £15K  
Mainframe/Assembler experience Bucks

DEVELOPMENT ENGINEER to £14K  
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The Appointments Register

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## SYSTEMS CONTROLLER LEADING TO DPM

This is an ideal career opportunity for someone, with operations and programming experience, to take on the challenge of managing a small installation in CENTRAL LONDON.

Initially you will assist with the implementation of the new accounting system to integrate with policies and claims, based on Data General CS40 hardware. Further developments using this system as well as the use of micro computing are planned.

### ESSENTIAL QUALITIES ARE:

- KNOWLEDGE OF PROGRAMMING, PREFERABLY BASIC
- FAMILIAR WITH OPERATIONAL STANDARDS AND PROCEDURES IN A MINI COMPUTER ENVIRONMENT
- SUFFICIENT COMMERCIAL EXPERIENCE TO QUICKLY UNDERSTAND THE EXISTING SYSTEMS

The progression to DPM will be dependent on your commitment and performance. A starting salary of up to £10k pa is offered.

For further information, write or phone Bernard Taylor on 01-930 4041. Weekends (07016) 66768.

(8183)

**Fraser Williams**  
Recruitment & Training  
19 Charing Cross Road,  
London WC2H 0ES.

## MICROS to £15,000 Design & Support

Our clients are crying out for microsystems specialists at all levels from Programmer (C, BASIC, PASCAL, CIS COBOL, 16 bit ASSEMBLERS) to Consultant, on package design and systems installation and support for users of:

IBM pc, SIRIUS, WANG pc, FTS, ICL DRS 20, ALPICOT, SINCLAIR QL, DEC RAINBOW, ALTOS, HYTEC, APPLE, NCR DECISIONMATE, COMMODORE.

If your microsystems expertise deserves higher rewards, or if you simply require more challenge and job interest, then call me to discuss vacancies, in London and to the West, with:

Package Producers, Network Suppliers, Software Houses & Computer Manufacturers.

Contact: Gordon Hunter or Arthur Flitter, Beaumont Management Services Ltd.,  
2/4 High St, Staines,  
Middlesex TW18 4EE  
Telephone: Staines  
(0784) 62131 (24 hours)

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MANAGEMENT  
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# DEC ENGINEERS £20k TAX FREE

We have been retained by a world leading manufacturer of CAD/CAM equipment to identify several customer engineers.

VAX experience is of prime value but PDP engineers should apply. Previous involvement with CAD/CAM peripherals will be a decided advantage.

You will be based in Dharan on the cooler eastern coastline of Saudi Arabia, 30 kilometres from the company's head office in Bahrain.

Engineers will have the security of a multi-million pound organisation behind them, yet also a ground floor involvement in this new venture into the Gulf market. Experience and promotion opportunities are always more readily available in the Gulf States and unequalled in this start-up environment.

The chance to acquire significant financial security is obvious. Promotion will offer even greater opportunities to establish a life-style far beyond your current expectations.

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SECURE YOUR FINANCIAL FUTURE. Call Steve O'Brien or Chris Bond on 01-637 9611 or send us your CV

Suite 201/6 Albany House 324 Regent Street, London W1R 5AA 01-637 9611

MANAGEMENT & EXECUTIVE SELECTION

## ENGINEERS at last something different

£14k

CAR

Europe

Well, there aren't many positions offering specialisation in disc products whilst retaining full interest in total systems. Cross-training is normally a rare occurrence and career progression in the UK and European sphere never as possible as with our client.

Whether you are currently an INSTRUCTOR, FIELD, SENIOR or SUPPORT ENGINEER, a position is available for you and you will eventually have the opportunity to be involved in all functions.

The company is the largest manufacturer in the world in their market place, yet will double its field and support engineering force over the next twelve months.

The expansion is nationwide; LONDON, HOME COUNTIES, NORTH, MIDLANDS. Indeed, there are also opportunities for German/French Engineers/Instructors in Europe.

These career opportunities are not run of the mill.

If you have in excess of two years' experience working on DG/DEC/HP systems ring us now for an informal discussion.

Call Steve O'Brien or Chris Bond on 01-637 9611

Suite 201/6 Albany House 324 Regent Street, London W1R 5AA 01-637 9611

MANAGEMENT & EXECUTIVE SELECTION

We are an autonomous Division of a multi-national corporation with a world-wide turnover in excess of one billion £'s. Some 400 staff are employed at 5 locations in the UK.

There is an impressively high level of commitment to information processing within the Division and we require a MANAGER to LEAD the 13-strong department FROM THE FRONT. An ability to control and deliver projects in a timely manner is considered vital.

The current configuration consists of an IBM 4331/2 with CICS under DOS/VSE. An outline plan for the installation of PCs has been formulated.

To apply for this position we would expect you to be currently a DPM or Project Manager in a similar IBM environment, technically aware, a strong personality and a good communicator.

The position reports to a member of the Divisional Board and the remuneration package will reflect the importance we attach to this appointment. Whilst working less than 1 hour away from London, the candidate will be able to live in rural East Anglia with its many attractions.

Call, or write with CV to ROGER WILKINS in London.



## Targa Computer Recruitment

19 Ropemaker Street London EC2Y 9AS  
Monaco House Bristol Street Birmingham B5 7AS

Telephone 01-588 9871 Telex: 25851  
Telephone 021-622 2045 Telex: 334237



(8097)



SPECIAL RECRUITMENT FEATURE

March 8 Issue

### OPPORTUNITIES IN THE MIDLANDS

You naturally demand the most from your computer hardware and that means you need professional staff with the necessary database experience to make sure your system works best for your business.

If you are currently recruiting professional dp staff, then the March 8 issue of Computer Weekly provides an added bonus to help you find the people you are looking for. Our special feature, highlighting the wide range of opportunities for dp staff in the Midlands, will create an ideal platform for you to spell out the advantages of working for your organisation.

This is just one of many career-linked features to be published during 1984. Our aim is to talk to individual groups of readers, both as employees and as people with particular skills and problems and is just one indication of Computer Weekly's commitment to providing the platform needed by recruitment advertisers when seeking staff.

Computer Weekly is Britain's largest circulation computer journal and continues to offer the best guarantee anywhere of coverage of today's computer-skilled professionals. Equally important is Computer Weekly's dominance of the key job-moving categories. More than ever before, coverage exceeds all other journals in the market.

To reserve space in the MIDLANDS FEATURE phone (01) 661 8080 today. Copy deadline: March 5

Classified Department, Quadrant House, The Quadrant, Sutton, Surrey, SM2 5AS

Computer Weekly

## Exciting New Positions In The South East Available Only Through KPSSL

### The soft touch

£10-18K

This well-established software house, with large corporation back-up, is seeking Programmers and Consultants to work on a wide range of applications including... process control; warehouse control; plant manufacturing; factory management and yields measurement.

The programmers will be required to have two years' experience and hopefully experience in one of the above fields. It is essential for the consultant to have at least one of the above skills and four years' experience.

If you have DEC PDP 11/70 or DEC VAX experience, with ASSEMBLER, FORTRAN, RPL or MACRO II and REXX and RPL this expanding software house would love to hear from you. Phone now!

### A personal interest

£11,000

A world-wide telecommunications company in the city are currently increasing their personal computer team within the D.P. department to handle development work and users' enquiries brought about by an increase in P.C. installed within the company. Ideally with a background on an IBM mainframe and IBM P.C.s the Programmer/Analyst required will have experience of the following: VM/CMS, ADRS and APL. As a bonus you could offer HAMMER WIZARD, STN and/or LOTUS.

Ambitious applicants with a personal interest in the future - phone now.

### Bank on a challenge

£13-15K

An exciting career opportunity is offered by this international bank. As Network Supervisor you will be responsible for the planning, implementation and installation of terminals and data communications systems - sometimes including voice configurations. You will be advising management on all aspects of network configuration and equipment selection, liaising with project teams and implementing new teleprocessing terminal control programmes, recovery procedures and security.

To become eligible for this company's excellent benefit package (including subsidised mortgage) and salary range you will have five years' networking experience and preferably a technical degree, the position will entail worldwide travel. Ring us now to hear more about this exciting career opportunity.

### Offer your expertise

£12-16k + CAR

This successful major computer manufacturer requires four Sales Support Analysts with an eye on success and expansion. A good knowledge of COBOL, PL1 and Database with a commercial bias in your work will help you qualify for these exciting opportunities in Farnham, the City or Milton Keynes. Together with a professional approach to your work and personal presentation you will become eligible for excellent remuneration and company benefits. Interested? Phone now for further details.

For further details of these and other permanent positions currently available contact: Jayne Baynton or Eriys Tunnard

Tel: 01-734 0152

(01-428 3832 or 01-720 0770 Evenings/Weekends)



Knight

Programming Support Limited

INTERNATIONAL COMPUTER CONSULTANTS  
Royalty House  
72 Dean Street  
London, W1



# SMR

## Sales & Marketing Recruiters Ltd

WITH TECHNICAL SUPPORT PEOPLE LTD.

### SALES EXECUTIVES FREEDOM TO BREATHE, ROOM TO GROW!

Many sales people never reach their full potential, because they are constantly frustrated by executive whim or stifled by corporate edict. How nice it is, therefore, to make available such jobs as these in

#### SOUTH EAST ENGLAND and the WEST MIDLANDS

that not only provide a 'ground-floor' opportunity within a fast growing and progressive organisation, but which also gives the individual salesperson freedom of action, scope for creative selling and real involvement in shaping the destiny of the company.

Our client is a well established name in both minicomputer based turnkey systems and computer terminals and has secured some 25% of a specialist market. Such is the success, that all of their existing salespeople consistently achieve target. This is most likely due to the company's unusually high investment in advertising.

We are seeking three accomplished salespeople; one with significant experience of selling DEC based commercial and industrial Turnkey Systems up to a value of say £200k, and two with a good track-record of selling Computer Terminals. In the former case, a pre-sales support analyst would also be considered. In the latter case, some exposure to DEC equipment will be advantageous, but not imperative. Whereas, a proven ability to communicate at a senior level, is essential.

An attractive compensation package is negotiable, including a company car and a variety of fringe benefits.

Please contact Lindsay Howie (London), or Roger Dodd (Midlands), quoting reference HSC/024.

#### LONDON & SOUTH

29 Oxford Street,  
London W1 (01) 734 9776

#### MIDLANDS & NORTH

Cathedral House, Beacon Street,  
Lichfield, Staffs. (05432) 56612

Answering Service after 6 pm and weekends  
SALES TRAINING, MARKET RESEARCH, RECRUITMENT

(7864)

### SALES BIT

Quality of Management - 85

## A trainer must have the talent to convince

THE staging of sales training is for many companies a process that seldom gets beyond the point of good intentions.

Everybody acknowledges that selling and product training is an essential function of an effective sales organisation; that all salespeople need to achieve at least a minimum threshold of selling skill and product knowledge and that this basic requirement should be sustained and augmented on a continuing basis. Yet when it gets to the crunch either the budget won't allow it or nobody wants to take time out from the field. (Perhaps a greater reality is the sales manager's lack of confidence in his own ability to get it together).

That is a sad commentary on the quality and perception of some sales managers, for any sales team that is not developing and generally "keeping up with the art" is not only failing to achieve its full potential but also at risk of falling apart as those individuals who feel a strong need for personal progress and development decide to go where they can better obtain it.

But let us discuss the good guys who have got their act together and

probably be running his own independent outfit and earning a lot more than the typical company sales affords, or be a "big wheel" in a major training outfit.

An in-house sales trainer has to be an experienced and accomplished salesman with a talent for teaching and organising. If he is to be of any real value to his company. Sadly, some so-called sales training managers are no more than failed salesmen who have been unable to find a safe hidey-hole in the relative warmth and tranquillity of marketing, and therefore see training as an acceptable alternative that is sufficiently far away from the "sharp end" as to cause them minimum discomfort.

I recall a sales trainer finding himself harassed by a particularly negative and "bolshy" salesman who apparently wanted everyone to know that he objected to having to attend this particular sales training course, besides which he didn't feel he needed any sales training. After all, that was strictly for new trainees!

He raised a barrage of pointed questions and negative remarks and did whatever he could to be

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made a firm commitment to introduce or continue with sales and product training.

One of the first decisions to be made is, who will do it - some super-smart high-flyer from inside or outside the company, or do you mess it up yourself?

There are two important points to remember about sales training: First, knowing all about the product and how to sell it is not sufficient qualification for imparting and implanting knowledge; the skill of being able to teach is paramount.

Secondly, responsibility for product training cannot effectively be sub-contracted to external organisations. No one knows your product as thoroughly as you do, particularly in terms of its exceptions and idiosyncrasies, its problems and opportunities. Using outsiders to put across such information is an absolute statement of management failure.

It is effective, if your sales organisation is big enough to justify it, to have your own full-time sales trainer.

But having a company sales trainer doesn't necessarily mean that all courses will be generated purely from internal resources. The primary function of such a person is to produce whatever training is necessary, in accordance with the demands of the sales organisation. In many instances this takes the effect of administering and co-ordinating courses which are wholly or in part provided by others.

In some major corporations some of the better salespeople are obliged to spend a period in the education department as part of their development towards management. That's a excellent idea. It was the practice at IBM when I was there, many years ago, and it didn't seem to do them any harm!

But few companies have a budget large enough to justify a full-time sales training manager. More to the point, sales training, as opposed to product training, is a much sought-after skill for which many specialist training organisations are prepared to pay highly. If a sales trainer is really good he will

disruptive. At first the other salesmen on the course either disregarded him or thought his antics rather immature and silly. But the sales trainer couldn't handle the situation. The other students soon perceived this weakness and the sales trainer's credibility was lost.

In next to no time the whole class switched itself off and generally proceeded to act as stupidly as the original perpetrator. Before the second day was completed the course was cancelled and the trainer departed ignominiously.

When asked why they had behaved in such an abominable manner the salesmen concerned sheepishly admitted they didn't really know other than it was possibly a subconscious protest about being "dragged out of the field", to be confronted by someone whom they naturally assumed would be an expert, only to find he had nothing to teach them.

If salespeople are obliged to attend training courses they expect to get something positive out of it that they can put to immediate use in the field and thus improve their sales performance.

What it all boils down to is professional credibility. As with the salesman before the customer, the sales trainer must be totally convincing in terms of his preparedness, ability to perceive and satisfy need, overcome objections and persuade people to his way of thinking.

That makes it an extremely demanding job that requires a lot of talent, and usually goes with a salary that is significantly less than that of the better salespeople they are training.

Hands up, who wants to be a sales trainer!

Alan Williams

The crossword appears next week.

**PUZZLE ANSWER**

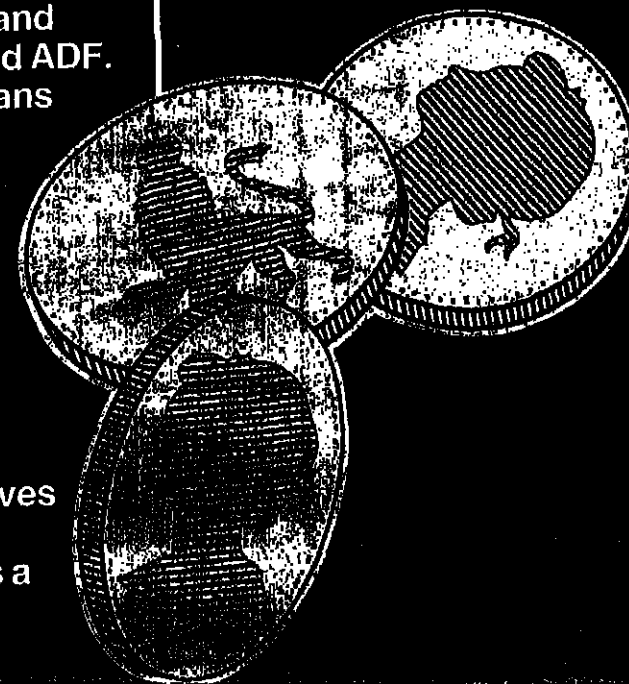
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Interviews will be held at our Reading Office 18A Bridge Street, Caversham, Reading.

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COMPUTER RECRUITMENT



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For more information on these and other assignments, contact Alan Williams, 18A Bridge Street, Caversham, Reading, RG4 7AT. Tel: 0734 219784. Fax: 0734 219785.

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The Market Leaders

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The Royal Military College of Science, Shrivenham, Oxfordshire, provides a range of undergraduate, postgraduate and post experience courses for mainly army personnel, and also supports an active research programme. From August 1st Cranfield Institute of Technology will be taking over the civilian teaching and research activities at the college.

For this appointment, the successful candidate will lecture at undergraduate, postgraduate and practitioner level, and generate and manage sponsored research, e.g. parametric modelling. Candidates should normally have a good first or higher degree in a relevant subject area. Recent teaching and research experience in management systems and their applications is required. Experience in structured systems analysis and design would be of particular advantage. A knowledge of the specialist requirements of project management information systems as applied to defence, industrial and government procurement would be useful. Salary scale: £7,150 to £14,125.

Application forms and further details are available from Personnel Department, Cranfield Institute of Technology, Cranfield, Bedford MK43 0AL. Telephone Bedford 726111, ext. 3337. Completed forms to be returned by March 23rd, Ref: 17/14.

(1721)

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